LIGHTWAVIN'

The Magazine For LightWave™ Animators

No. 4 November/December 1997
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JOHN TESKA
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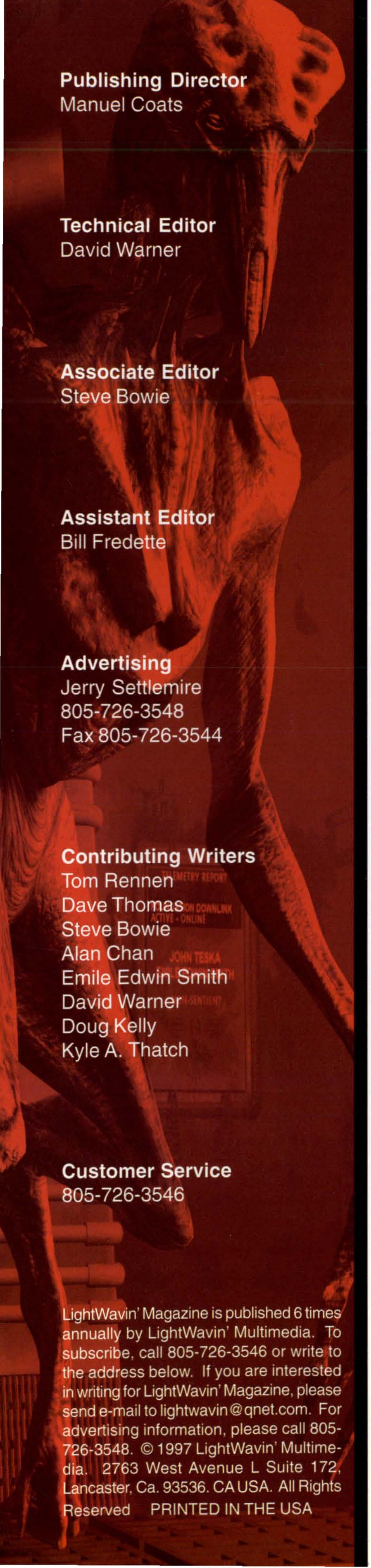

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LightWavin' Magazine is published 6 times annually by LightWavin' Multimedia. To subscribe, call 805-726-3546 or write to the address below. If you are interested in writing for LightWavin' Magazine, please send e-mail to lightwavin@qnet.com. For advertising information, please call 805-726-3548. © 1997 LightWavin' Multimedia. 2763 West Avenue L Suite 172, Lancaster, Ca. 93536. CA USA. All Rights Reserved PRINTED IN THE USA

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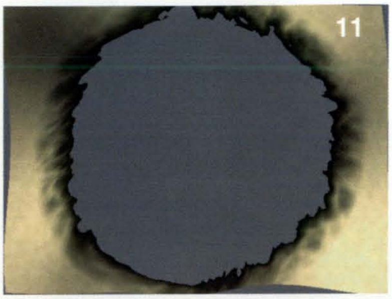

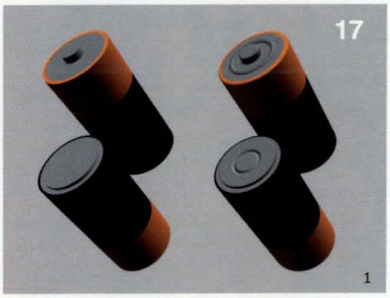

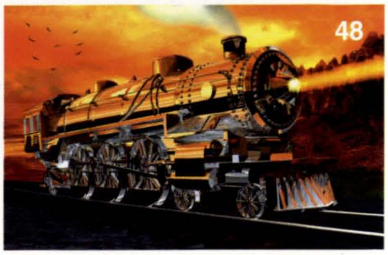

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EDITORIAL

Summer's gone, and the year-end is approaching. To date, 1997 has been a great year for NewTek. They've recently moved their HQ to Texas, and must be VERY satisfied with the interest in their 'new and improved' show presence. NewTek's booth (and LW 5.5) drew huge crowds at the recent Siggraph convention (see the Siggraph '97 article on page 10). The NewTek Expo will be right around the corner by the time you read this, and to cap the season a swarm of 'really cool' plug-ins are expected soon.

It's been an eventful year for NewTek and our favorite 3D program, and it's been exciting for us here at LightWavin' Magazine too! With four issues under our belt, we're maturing. The rapidly expanding 3D field demands that we grow with it. You'll see a number of changes in this issue, and many more in the future (we've concentrated on LightWavin's appearance this time around).

What have we changed, and why? One thing you'll notice is an increase in the page count, but a reduced number of those pages with colored backgrounds. We polled readers (over the Internet) and found the majority prefer a slightly more traditional layout - more 'black text on white' pages. What kind of text, you ask? That's our second change. We've enlarged the type size for easier reading.

Content-wise, most seem pretty happy, but way up here in the LightWavin' Towers penthouse, I'm not satisfied! This is not to say our writers aren't doing a good job... they are (in fact, they are doing a fantastic job!) Still, I have a vision of where I want the magazine to 'be' and it's not there yet. Will it be a year from now? I don't know. What I do know is this: ALL those involved in LightWavin's production (especially me!) are working hard to make sure we get as close as possible, as soon as possible.

LightWavin' will continue to increase its size, too! It will host more feature articles and more reviews per issue. There will be more interviews than in the past, and an increase in the number of regular columns (in fact, there's a new column beginning this issue - more on that later). The CD-ROM will be made plug-and-play (so you can just pop it into your drive and be prompted with menus).

Now that we're adopting a more traditional layout, how will we differ from other periodicals? One thing you'll find refreshing about us - we don't pull our punches! LightWavin' Magazine isn't dependent on its advertisers for funding. It's not subsidized by NewTek or any other company! Being small enough to survive comfortably on the proceeds from magazine sales, we can print what we really believe. When we review a product, it's a fair and impartial review. If the product sucks, our readers need to know. Most magazines decline to print a review critical of a product handled by an advertiser. This is one area where I feel LightWavin' stands out from the 'pack,' and *is* up to my personal standard (some might say we're 'brutally' honest!)

So, in future issues you'll find we lean to 'tell it as it is' articles. These are bound to upset some readers, and maybe even some companies. That's part of the game. If a company can flog half-assed products and still receive good reviews, we all suffer. That company needs to know its product is viewed as sub-standard, and exactly why. Then subsequent releases of that product can be improved. Heck, here at LightWavin' we go through this ourselves. We value constructive criticism. It helps us refine LightWavin', getting us that much closer to my ideal. I'm certain most readers will particularly enjoy these articles, because nobody else has the 'cojones' to print them.

You'll find a new column called RANTINGS has been added in this issue. It discusses topics untouched by the other magazines. The column might seem harsh to some, but we think you'll appreciate and benefit from the hard-hitting and frank opinion of our new contributor.

I hope you enjoy the new look of the magazine. If you have comments of any kind, please e-mail us (at lightwavin@qnet.com). Until our next issue, keep that mouse rollin' - and keep on LightWavin'!

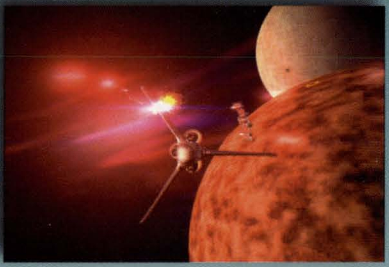
Manuel Coats, Publishing Director

The cover image this month is of Species 8472, from Star Trek: Voyager. Produced by Foundation Imaging and modeled and animated by John Teska. Image by Emile Edwin Smith.

get real

Duracell Battery commercial - courtesy of Digital Domain.

The Titanic miniseries - courtesy of Digital Muse.



Star Trek game - courtesy of InterPlay Productions.

Babylon 5 - courtesy of Foundation Imaging.

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FROM THE FRONT

SUPER GLOW 1.0

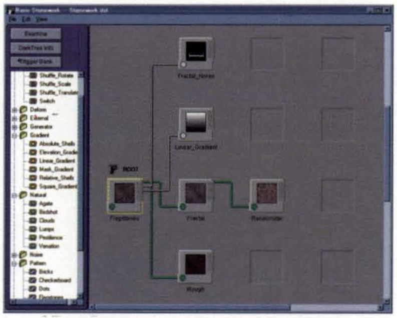
Super Glow is an advanced glow shader/image filter for NewTek's LightWave 5.0. Available on both the Intel and Alpha platforms Super Glow makes a number of advanced shading features available to the LightWave animator. Super Glow brings more than twenty new features for controlling glow on LightWave surfaces. With these features Super Glow can create colored glows, gradient glows, smoke and gas effects and more. For more information on this product, check out the review of Super Glow in this issue. The demo version of the software is on the LightWavin' CD-ROM. This demo version of Super Glow contains the complete Super Glow package with on-line help and manual. The demo version does have a few limitations. It will not render glows on images larger than 320x240 and it doesn't work on ScreamerNet. There is also an advertisement that will appear before each frame.

3DVIEW

A new Shareware program called 3DVIEW is now available. It was designed to be a quick viewer for the most commonly used 3d object formats. With this software you can easily and quickly take a look at your 3d objects. Basically, 3DVIEW is like a picture viewer but for 3d objects. 3DVIEW supports and renders several 3d object formats including: Imagine, LightWave, Caligari/Truespace, Vrml 1.0, USGS Dem. (3DMF and 3DS in the registered version only). We've included it on the LightWavin' CD-ROM or you can get more information by visiting www.pannonline.hu/3dview/ or you can Email: sb@luna.aszi.sztaki.hu.

GENESIS VFX

Positron announces GenesisVFX| an extraordinary special effects plug-in for NewTek's LightWave 3D. With Genesis, users can create a multitude of effects, including spectacular outer space effects, lens flares, lightning, sparkles, glows, heat distortions, smoke, gas clouds, color and even psychedelic images. The same package can be used to add rich subtle nuances to images. Genesis effects are built from elements which can be animated individually, combined in any way, colorized or morphed. Any number of elements of any type can be linked together. Genesis ships with hundreds of pre-built effects for every need. Existing effects can be modified to meet a user's specific needs. Once an effect has been created, it can be attached to objects in the workspace or stand alone as a unique image. "GenesisVFX gives users an arsenal of special effects in one package," said Positron president Brent Malnack. "We look at it as being the Swiss Army Knife of special effects creation." GenesisVFX for LightWave 3D has a suggested retail price is $419.95. Positron - 800/365-1002 or 402/330-7011 www.3dgraphics.com.



DARKTREE TEXTURES

This software creates algorithmically generated texture maps that work well with LightWave. Included on the LightWavin' CD-ROM are images that were rendered in LightWave using texture maps created by DarkTree Textures. Also included are three sets of texture maps for LightWavin' readers to use. A *readme* file explains how to use the different texture maps and a screen shot shows how the flagstone texture map was made. Darkling Simulations - skyler@darksim.com - www.darksim.com.

DINOSAURSROM CD - DEMO OBJECT FOR LIGHTWAVE

We're happy to announce that we have a free LightWave object from Gruppo Iride's *DinosaursRom* on this issue's LightWavin' CD-ROM. It's the Gallimimus object (low quality version). We've also included animations for most of the objects in both QuickTime and AVI formats. You'll find it all in the 'Dino' directory. For more information on the DinosaursRom, check out our *CD-ROM ROUND-UP* review on page 31.

WAVEFILTER

We've included sample animations on the LightWavin' CD-ROM showing the functionality of WaveFilter. It can be found in the 'WaveFilter' directory. Check out this issue's Company Profile on Unlimited Potential to find out more about the company behind WaveFilter.

ROBERTO'S ALPHABETIZER FOR LIGHTWAVE 3D V2.0

Roberto's Alphabetizer for LightWave 3D is an Excel 4.0 macro. When you load a LightWave scene into Excel and you run the Alphabetizer macro the scene is processed and objects in the scene are alphabetized. You can then load the new scene in LightWave and enjoy! Now you can easily find your object. Just think - if your scene has more than 300 objects.... No more long objects search. We've included the program on the LightWavin' CD-ROM for your enjoyment.

SURFACE EFFECTORS - ANIMATIONS

We've included approximately 26 megabytes worth of animations created with Surface Effectors on the LightWavin' CD-ROM. To find out more about Surface Effectors, check out the review on page 11.

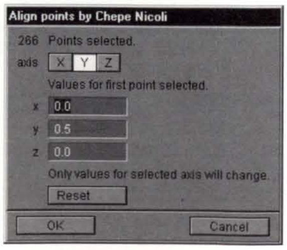
MAC PATCH

The LightWavin' CD-ROM includes the long-awaited patch for the MacOS version of LightWave and Modeler 5.0 for those of you who haven't yet downloaded it from NewTek's FTP site. More information on the patch is available in the 'patch' directory.

PLUGINS BY CHEPE NICOLI

We've included a few plugins by Chepe Nicoli on the LightWavin' CD-ROM. If you enjoy them, send him a note at ddigital@compuserve.com.mx.

AlignPoints - "I wrote AlignPoints because every time I wanted to align some points I had to use the Info command to retrieve the position on X, Y or Z and then use the SetValue command to align the points. This is no longer the case with this plugin."


Align points by Chepe Nicoli

266 Points selected.

axis X Y Z

Values for first point selected.

x 0.0

y 0.5

z 0.0

Only values for selected axis will change.

Bars&Pies - This plugin creates pie charts quickly and easily. To the left are some ex-

(Continued on page 44)

GETTING DOWN TO BUSINESS

By Tom Rennen

GEE, I SURE WISH I HAD A JOB!

Hello fellow Lightheads! Here we are again with another installment of this column. I have been very busy as of late. I've been marketing in Hawaii for the last 3 months! Yes, that's right, marketing. If there is one area that stands out regarding the success of any small business, this is it. As I have said before, 'You can have all the tools and talent in the world, but if you can't get jobs, you're hosed!' Being hosed is not a pleasant experience I can assure you. So, I will make an effort to save you from that by passing along a few tips that you may find useful.

PRESENTATION

The material you present to a prospect should be as good as possible. I am speaking of your demo tape or other visual material. This is not to say that it should be the kind of work you see on network television. However, it should be well edited, and the contents should be free of errors like tape dropouts, glitches, etc. We could go on and on about how to put together a great demo but the areas I have mentioned are universally important regardless of to whom you are selling your services.

CHOOSING YOUR MARKET

This is one area that has the tendency to confuse some people. It is very important that you choose your markets based on your current ability to produce work. This means market your services to people who will buy them. If you are limited somewhat in your abilities, be it knowledge, equipment, or whatever, sell yourself to people who will buy what you have to offer. If you're just starting out and you are creating lower quality work, then sell to people who have small budgets, like churches and wedding videographers. There are a ton of these customers out there. You won't get huge money for the work but you will get lots of work. You wouldn't put broadcast work in front of these kinds of buyers because their first impression would be, "WOW! Great work!" Their second impression would be, "WOW! We can't afford this!"

You see, selling to the wrong market will keep you broke. You must be realistic with yourself when judging your capabilities, then go after those markets that can use what you have to offer. As your talents and resources grow, you elevate yourself to better paying markets.

OK, WHERE DO I START?

You may have heard the saying, "When opportunity knocks..." Well, what if opportunity has its hands in its pockets? You could be waiting a very long time for it to knock. Opportunities don't just come along, they're created! Once you take steps to create them, they begin to happen on their own. If you want work, you have to go and get it. It's that simple.

Once you have determined the quality of your work, begin to make a list of who would buy it. Then start calling prospects one by one. Look in the Yellow Pages for the zillion churches in your area. Start with the ones with the largest ads and call them. Ask to speak to the individual who is in charge of their television or video department and try to set up an appointment to show them your work. What if they don't have a video department? Good question! I'm glad you asked! Start one for them! You don't have to be on television to need video services. Propose creating an orientation tape to give to new members. Or make a short tape detailing each area of ministry. This is creating opportunity!

Most cities have cable access channels. This is free TV! You can tell your prospects that you will put them on television for free if they cover the cost of production. What a great deal! Check with your local cable company regarding access in your area. Once you begin to market yourself in this way, you will see things begin to happen. You must arm yourself with as much information about your work as you can. Use as many free resources as you can. Put deals together! If one church can't afford to do it then tell them you are starting a Ministry Media Center. This is where you get 4 or 5 churches to pay as a group. They all share the cost of the project. You'll have to tell them that they will share some of the work but it's a way to make it affordable for all of them. When you create that big cross with the angelic light glowing behind it, they all get that same work. Or you could create a one-hour show and give each church a 15-minute segment.

I'm just using the church thing as an example. You could apply this way of thinking to just about any prospect. If you can't, you should immediately consider

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SIGGRAPH '97

STRONG SHOW PRESENCE FOR LIGHTWAVE

By Dave Thomas

We know that many of you already know a lot of the details of what went on at Siggraph this year, but for those of you who don't, and for those of you who might find a tid-bit of information in this article that you missed otherwise, this article is for you.

This year's Siggraph convention was held in Los Angeles, California. The exhibition portion of the convention was well attended, with thousands of convention-goers "enjoying" the 100+ degree temperatures. NewTek again had a big presence at the show. Their booth setup was the same as the one they used at this year's NAB. There was a main presentation area that hosted consistently large crowds. There was also a circle of workstations where LightWave was continuously demonstrated, as well as a collection of stations where third party developers were showing their products. All around the booth were monitors showing off some of the latest TV/Film work by various LightWave animation houses. The setup is a good one, and it seems that NewTek is going to stick with a design that works.

There were three different presentations at the main demo area. Of course, the main one was about all the new features of LightWave 5.5, which was introduced this spring at NAB. The program has been shipping for a few months now, and has been well publicized, so there's no need to go over all its features here. If you haven't purchased it by now, go get it! It's well worth the upgrade cost.

There were a few new announcements from NewTek. The first was The Motions Plug-In pack. This package consists of five different animation aids. They include Follower, which lets multiple objects follow the motions of a lead object. It allows you to offset the movement, rotation and/or scaling of following objects, and introduce levels of randomness.

The next plug-in is Oscillator. It controls oscillating movements, such as the flapping of a bird's wings. The demonstration showed how easy it is to put together a realistic animation of a flying seagull using the plug-in.

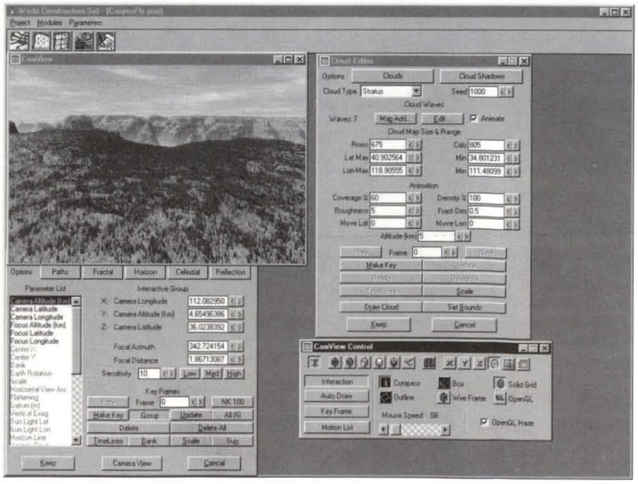
The third plug-in is Gravity. As the name suggests, it allows you to subject an object to gravity and have it respond realistically. While certainly not as full featured as a dynamics package, this plug-in does allow you to create realistic gravity effects.

The fourth plug-in is Serpent. If you've ever wanted an object to conform to a path with snake-like motions, then this plug-in is for you. This feature has long been available in many other 3D packages, and it's nice to finally see it in LightWave (even if it's an add-on).

The final plug-in is Cyclist. It gives you control over repetitive motions, and is probably the most powerful plug-in of the set. For example, it allows you to define the rotation of the wheels of a car, and then scale that rotation appropriately to the speed of the car. Other applications include piston type movements. One of the examples shown was a toy train moving along a track with proper wheel rotation and piston movement. This looks somewhat similar to a plug-in that was briefly demonstrated at NAB 1996, but was never released. Word has it that this is NOT the same plug-in, though it does similar things. I think that these plug-ins will be a great addition to the LightWave tool-kit. The package is supposed to ship around October, with a list price of $189.

Also confirmed at the show was the existence of the long rumored Film Grain plug-in developed by Worley Labs. This package lets you add film grain to LightWave renderings, and features controls for adding grain selectively to objects or the background, or removing grain from an image sequence. No price or shipping date was announced for this package.

Something of a surprise at the NewTek booth was the demonstration of a new paint package. It was developed by the folks behind TVPaint, and contains a lot of very interesting features. The package includes all the usual options, and tons of filters and special effects processes. The package supports animation with features like onion skin, key framed animation of brushes, a brush recorder, a fully editable timeline, and many other tools. Other advanced features include a scripting language, and the ability to paint on LightWave objects. The whole program works in full 24 bit with alpha channels and unlimited layers. While there was obviously still work to be done on the program, it has features that are not available on any other PC based paint package, and I'm really looking forward to seeing the final version. While no price for the program was announced, the package should ship sometime next year.


Project Modules Parameters
CamView
Options Paths Fractal Horizon Celestial Reflection
Parameter List
Interactive Group
Camera Altitude (km)
Camera Latitude
Camera Longitude
Focus Altitude (km)
Focus Latitude
Focus Longitude
Center X
Center Y
Bank
Earth Rotation
Scale
Horizontal View Arc
Flattening
Datum (m)
Vertical Exag
Sun Light Lat
Sun Light Lon
Horizon Line
Low Med High
Key Frames
Prev NK 100
Make Key Group Update All (6)
Delete Delete All
TimeLines Bank Scale Sun
Keep Camera View Cancel
Cloud Editor
Options Clouds Cloud Shadows
Cloud Waves
Map Add... Edit...
Cloud Map Size & Range
Animation
Prev Next
Make Key Update
Delete Delete All
Scale
Draw Cloud Set Bounds
Keep Cancel
CamView Control
Interaction
Auto Draw
Key Frame
Motion List
Compass Box Solid Grid
Outline Wire Frame OpenGL

X: Camera Longitude 112.082950
Y: Camera Altitude (km) 4.65436386
Z: Camera Latitude 36.0238392
Focal Azimuth 342.724154
Focal Distance 1.86713087
Sensitivity 10
Frame 0

Cloud Type Stratus
Seed 1000
Waves: 7
☑ Animate
Rows 675
Cols 805
Lat Max 40.902564
Min 34.801231
Lon Max 118.90555
Min 111.49099
Coverage % 60
Density % 100
Roughness 5
Fract Dim 0.5
Move Lat 0
Move Lon 0
Altitude (km) 5
Frame 0

Mouse Speed 58
☑ OpenGL Haze

Screen Shot of World Construction Set

There were a number of LightWave-related third party vendors at the show. Desktop Images was on hand with their complete line of LightWave instructional videos. They had a few new titles including "Organic Modeling And Animation," "LightWave 3D Plug-In Power" (featuring tutorials on Macroform, Particle Storm and WaveFilter), and "Steamer," a new tutorial on LightWave 5.5's volumetric lighting engine.

For those with a big budget and an interest in character animation, there was the $14,900.00 Monkey 2 from Digital Image Design Incorporated. The latest version of this armature input device includes the ability to customize its configuration (for example changing it from a human to a spider-like shape). The device also has realistic joint limits built into the skeleton, which certainly decreases setup time. The Monkey's construction quality is first rate; it feels very solid. The news at Siggraph was that there is now a plug-in for LightWave that works with the Monkey 2, letting you bring its position data right into the program.

If you've ever wanted a few more options for lens flares than LightWave offers, then you should look into the GenesisVFX package from Positron. This program lets you create lens flares, glows, gas clouds, sparkles and other visual effects. The effects are built from different elements, each of which can be animated/controlled separately. The program has a preview mode so you can get an idea of what

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PRODUCT REVIEW

By Dave Thomas

SUPER GLOW & SURFACE EFFECTORS

SUPER GLOW

If you've ever used the LightWave 3D glow feature, and wanted more control, there's a new plug-in that might interest you. Super Glow from Pontari Productions creates glow effects on LW objects, and adds control and parameters that go well beyond the bundled glow feature. You order Super Glow directly from the developer. After your order is confirmed, you're given a password to download the plug-in from their web site. The plug-in, documentation, help files and tutorials are included in the package. It's possible to get a hard copy of the manual, but I found the materials included with the download package to be more than adequate. The documentation is clear with plenty of illustrations and a number of quick tutorials to get you started. The company is good about responding to tech support e-mail, and is very open to user suggestions.

The plug-in is easy to use. The glow works on a surface basis, so it is assigned in the surface panel. Each glow is numbered, and up to 32 different glows can be used in a scene. That is almost certainly overkill, but it's nice to know the ability is there. Besides applying the glow to a surface, it is

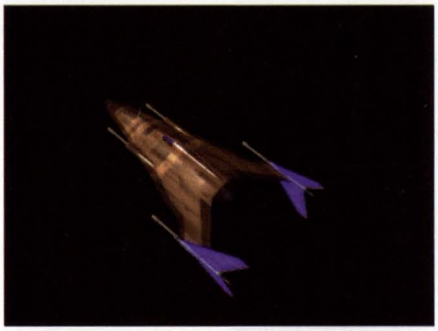
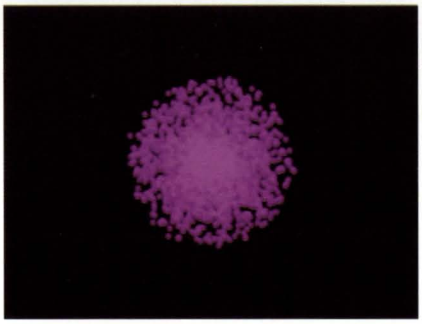
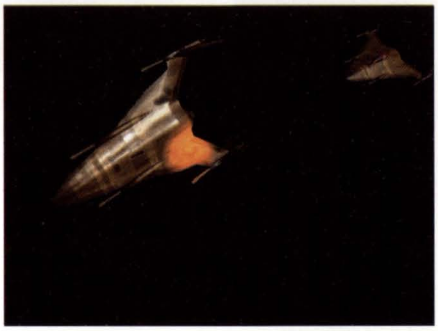


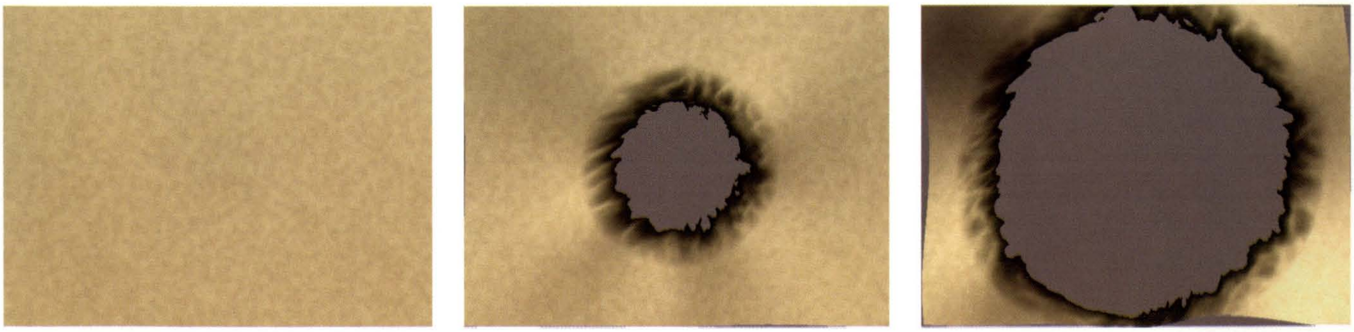
Image showing super glow applied to wings of space fighter object.



Gas cloud created with super glow.



Example from Surface Effectors animation. Glow on spaceship wing.



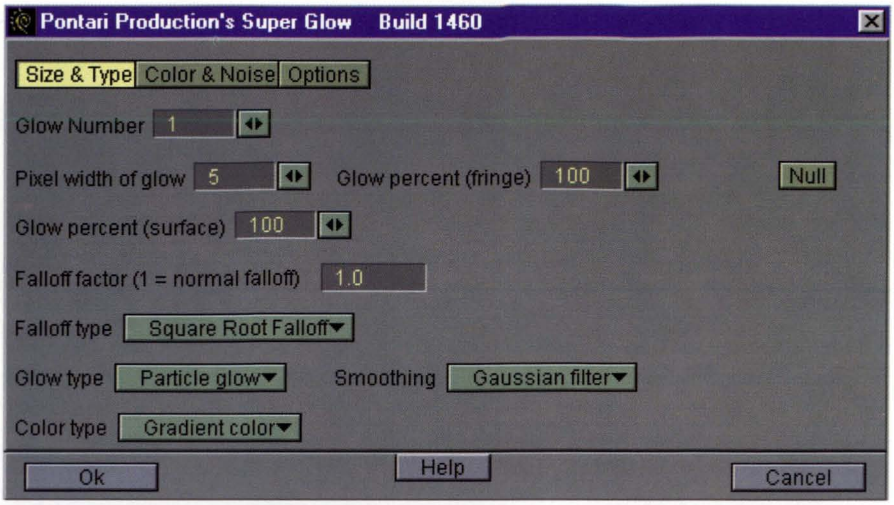
Series of frames showing burn effect from Surface Effectors.

also possible to apply a Protection Shader that will keep the glow from appearing on a nearby surface. This is a very handy feature, letting you really control how the glow affects your objects. There is also a Brightness Shader that will let you apply a brightness image map to a glow.

After applying a glow to a surface, you set the glow's parameters from the Super Glow Image Processing plug-in on the Effects panel. When you bring up the options panel, you will see there is a lot of control available for each glow. Size, falloff and glow percentage can all be set. The color of the glow can be chosen, and it is possible to make a glow gradient between two colors. The package also lets you use noise to affect the glow. There are three different types of noise (Perlin, Turbulence and Veins), and options to control the amount of noise in the glow and how often the noise changes, which can lead to all sorts of interesting animated effects.

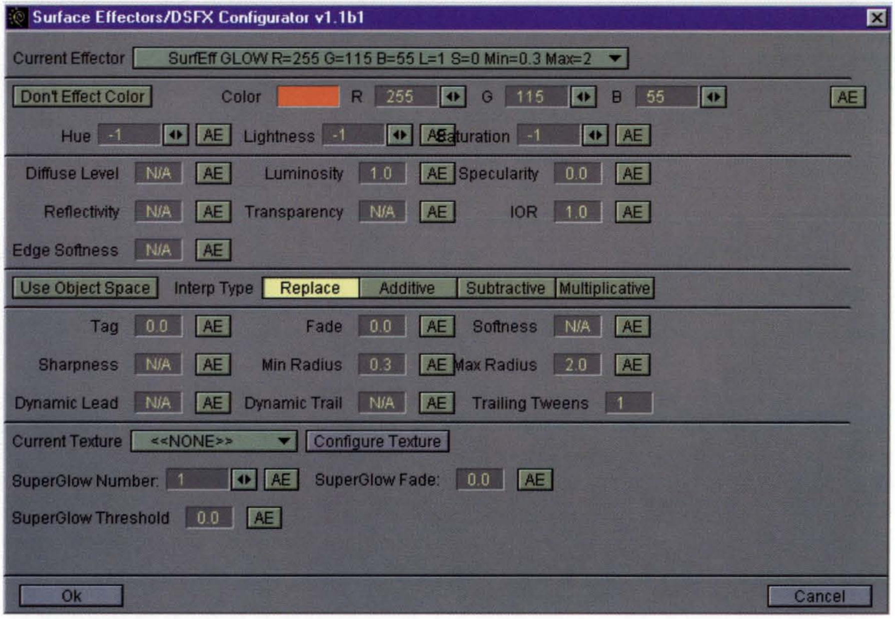
Certain parameters have the word "Null" next to them, meaning that these parameters can be animated through the use of null objects. The dialog box for each null control displays the parameters that can be controlled by the null's motion. Setting up the nulls can be a bit tricky at first, especially if you don't pay attention to all the parameters that a null can control. It might be better if a null only controlled one parameter, as opposed to the three or four that each can control now. If you use the motion panel to animate the null (as the manual suggests) as opposed to moving the null in Layout, the process does work a lot better. The ability to animate parameters is a good one, so its inclusion is welcome.

Super Glow has a couple of other useful options. It is possible to render to fields and save the glow information in the alpha channel, neither of which is possible with LightWave's native glow. These two features alone make it worth buying the program. Other useful options include making only edges glow, correcting the glow for the pixel aspect ratio, reversing the glow and antialiasing the glow edges. The program also lets you hide the glow based on Z buffer information, which keeps the glow from appearing on objects that it should be behind.



Glow Number 1
Pixel width of glow 5
Glow percent (fringe) 100
Glow percent (surface) 100
Falloff factor (1 = normal falloff) 1.0
Falloff type Square Root Falloff
Glow type Particle glow
Smoothing Gaussian filter
Color type Gradient color

Super Glow interface panel.



Current Effector SurfEff GLOW R=255 G=115 B=55 L=1 S=0 Min=0.3 Max=2
Color R 255 G 115 B 55
Hue -1
Lightness -1
Saturation -1
Diffuse Level N/A
Luminosity 1.0
Specularity 0.0
Reflectivity N/A
Transparency N/A
IOR 1.0
Edge Softness N/A
Interp Type Replace
Tag 0.0
Fade 0.0
Softness N/A
Sharpness N/A
Min Radius 0.3
Max Radius 2.0
Dynamic Lead N/A
Dynamic Trail N/A
Trailing Tweens 1
Current Texture <<NONE>>
SuperGlow Number: 1
SuperGlow Fade: 0.0
SuperGlow Threshold 0.0

The Surface Effectors interface.

This is a useful plug-in. It is easy to use and produces good results. It is inexpensive, and certainly more capable than the glow function that comes with LightWave.

Surface Effectors 1.1

Want to create all sorts of special effects? Look no further than Surface Effectors. What's an effector, you ask? It is a Null object with one or more parameters assigned to it that can change the surface of an object when it come within a user-defined distance. When effectors are animated, their assigned parameters change, leading to the creation of all sorts of interesting effects.

Like Super Glow, Surface Effectors can be purchased on-line (though it is also available from some dealers). When you download the product, you get the plug-in, the documentation in several formats (including HTML) and a bunch of sample scenes and objects. The documentation is pretty good, though I thought the tutorials could have been a bit more extensive. The sample scenes are really good, though. Examining them will give you all sorts of interesting ideas to try with Surface Effectors. New tutorials are occasionally added to Surface Effector's web site, s-check there occasionally to see what' been updated

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RANTINGS !

A No-Holds-Barred LightWave Column

by Emile Smith

Narrative Angst, and Art School Anxiety

This column takes aim at issues that bother me - and should bother you too! I'll 'shoot from the hip,' giving you my 'no-holds-barred' convictions in each issue of LightWavin'

To begin with I'm going to dig back into my past. I want to write about something I experienced in school that not only affected myself, but currently affects many people. I'm referring to the 'art' in art school; the closed minds of the professedly 'open minded' instructors. Many exhibit a severe inability to convey the basics students will require to achieve their goals once they leave the academia. This condition persists in schools large and small.

> I see many demo reels in my work. I've noticed something.... without exception, all the ones from art schools suck !

I see many demo reels in my work. I've noticed something.... without exception, all the ones from art schools suck (including my own first demo). Most manifest poor animation. They often employ a narrative style their teacher told them was the penultimate expression of their 'inner aura' or some other artsy bull. I fought with my professors daily over their definition of art. All but one seemed to think art had to look like shit, have no production value, and tell the story of the artists 'inner aura' before it could even be considered presentable. If anyone tried to make their work look professional and polished, he automatically failed. These are supposed to be open-minded people with vision!

They overlook the fact that you can have both. A production doesn't have to look like it was done by a 4-year-old on mescaline to be good! Take "City of Lost Children" from Jean-Pierre Jeunet and Marc Caro as an example. This stunning example of narrative is production at it's finest. The effects and storytelling work so well one is hard-pressed to make any negative comment (if you haven't seen it, go out and buy it or rent it - it is so worth it). Now, no student is going to have the resources used to make this kind of film, but they can aspire to reach it - and it will show that they did! Many professors don't realize this. We were shown work by Cassavetes, and films like 'Blade Runner', as examples of narrative... Duchamp and Da Vinci as testimonials to 'true creativity.' The professors were forgetting what made most of us want to be filmmakers in the first place - fun.

I grew up on a healthy diet: 'Star Wars' and 'Star Trek' (not to mention Diet Pepsi.) This is why I wanted to work in this field (the caffeine!) When I was a kid, I lugged my parent's video camera and separate video-recorder out to the backyard to make my own 'Star Wars' or 'Apocalypse Now.' You could see the hands holding up the Tie-fighter (as it rounded what would be a three thousand foot high oleander) and the clothesline holding up GI-Joe's F-14 (as it made a strafing run on tomato plants), but it was a blast! I wanted to do this for a living, but make it look good! My professors had other ideas and, as I mentioned, we fought over this.

I am the first to admit that narrative is the most important aspect of film-making (just look at 'Volcano' - on second thought don't!) but it's not the only aspect. Even if you are trying to convey a 'deeper meaning,' it should still look good! The old adage that 'if it looks good it's taking away from the meaning' is crap, just an excuse.

> Lately I'm seeing the results of a towering incompetence at preparing students to join the real world.

Lately I'm seeing the results of a towering incompetence at preparing students to join the real world. Whether the instructor lacks knowledge of what is truly needed, or is trying to convey some personal vision, there's no excuse. The technical fundamentals needed for the student to perform in a production environment have not been taught. It may feel great to push someone to communicate in a new medium, but the technology has moved far beyond the 'floating ball' and camera-moves that makes you want to vomit.

I've seen many demo reels that are sadly failed attempts to tell some kind of story. They fail because of gross ignorance of the medium they are working in. They evidence no knowledge of the use of camera moves, framing or motion. Instructors SHOULD be teaching their students the fundamentals of film-making before they even touch the computer. Show them how to frame a shot. Teach them about leading action, and the 180-degree rule. Tell them that even though they're working with a virtual camera (instead of holding one in their hands) there is no difference in what is perceived on screen. A badly framed shot of a talking head filmed while the camera-person was doing jumping-jacks around the subject looks just as bad in 3D as it does if it was shot on video.

Teach them to look at what they are trying to accomplish in the computer as if it were real. Have motivation for the blinding light coming in from the right and turn off ambient light. If you're doing character animation, make your character walk like it would in real life. If it's a dog, make it move like a dog! Make a human move like a person really would (for a dog-man, think about it - make it move like a dog-man would.) If spaceships are your gig, take into account some basic flight ballistics. For an atmospheric ship, give it wings, or some other lifting power. A large 3000 person cruiser should 'lumber' across the screen slowly, to give it a sense of scale.

I'm sure there are recruiters out there, snapping up the really hot-shit artists before we get to see any of their work, but they are few and far between. I would bet my left arm that they already had all the knowledge that I've been talking about before they ever signed up for classes.

Having read these comments about the quality (or lack of it) of most reels, you are probably wondering "Then what the hell should I do?" In all honesty, rack up your credit card with a PC and Lightwave. Learn how to use it, from tutorial videos and info available on `the net.' Aspire to make your projects look like the stuff you see on television and in the movies. Sit down, and go frame-by-frame through great work by others. Look at all the different aspects of it until you know how it was done (it may be a lot simpler than you thought.)

If you really want to go to school, take film and video classes. I know there are some schools trying to remedy this situation, by bringing in people from 'the industry' to show them what needs to be done. Until that happens, I'd advise you to be very leery of going to school with the idea that you are going to come out ready to jump into the production world and take off running.

Emile Edwin Smith is currently an animator at Foundation Imaging working on many different projects. You can try and tear apart his world or humiliate him by dropping him a note at: emile@foundation-i.com

On-Topic

Questions and Answers from the LightWave Mailing List

by David Warner

A lot has happened since the last issue...LightWave version 5.5 is now shipping, NewTek has moved their corporate headquarters, and the LightWave mailing list now has a new home!

The buzz over LightWave 5.5 is very exciting and despite a few minor bugs that are already being fixed, the consensus seems to be that the newest version of LightWave is definitely a "must-have". The new features list is far too long to go into here but it's safe to say that once you upgrade to version 5.5, you'll never look back!

NewTek continues to take steps in the right direction and this is evidenced by their continued growth. The recent move from Topeka, Kansas to San Antonio, Texas will give them room to expand for quite a while. This is a very good thing because if Hollywood's acceptance of LightWave is any indication, then NewTek will need to be prepared for the huge success that they are sure to experience in the coming years. All LightWave animators had better be prepared to ride this wave of success because many movie producers are taking note of what LightWave is capable of and the demand for truly talented animators is growing rapidly!

In an attempt to keep up with the ever-increasing number of new LightWave users who are seeking online help, I have moved the LightWave mailing list to a new and much more powerful mail server. With a tremendous amount of assistance from Beth and Marvin Landis, the list is now being run from a mainframe computer at the University of Arizona and things have never worked as smoothly as they are now. The dark side of this improvement in service is that the number of messages per day has climbed to an eye-numbing 150-200 pieces of e-mail per day! Subscription information and monthly message archives can be found on my web site (http://www.tv3d.com) but please be aware that many people find it impossible to keep up with the huge amount of useful LightWave tips that flood their mailbox on a daily basis.

And now for a sampling of some of the recent discussions that have taken place on that very same LightWave mailing list...

Q: When using procedural textures, I sometimes notice that the texture has an undesirable flicker or creates weird patterns on the screen. Why is this happening and what can I do to prevent it?

A: Procedural textures are fine for objects that will be close to the camera but a moire pattern will start to appear as the object gets further away. Part of the reason this happens is because procedural textures do not have the same kind of anti-aliasing options as regular image maps. Anti-aliasing will significantly reduce jagged edges and artifacts in your texture but in order to take full advantage of LightWave's anti-aliasing capabilities, you will need to apply your texture as high resolution image map instead of using a procedural texture. Unfortunately, by using an image map you lose the ability to customize the appearance of your texture, so unless you have a large library of nice image maps to choose from, your objects may start to look very similar to each other. One way to get around this is to simply apply aprocedural texture to a flat plane that is positioned perpendicular to the camera with even lighting...tweak the procedural texture values until you have the texture looking good and then render this scene as a High or Print resolution image. Now you can apply this image map as your texture and have full access to all of the Anti-Aliasing and Pixel Blending options available from the texture panel.

Q: What's the best way to preview an object's surface attributes without rendering out the entire scene?

A: If you are using LightWave 5.5 then you have easy access to some very good previewing options with fully-textured OpenGL and RenderGL (check your manuals for details on using these) but there is also an excellent application available for FREE from the MetroGraphx web site (http://www.metrografx.com). The program is called 3D Viewer and it offers a number of very useful object previewing options in a simple drag-and-drop interface that "hovers" over the LightWave interface.

The most accurate way to preview your object's surface attributes is to simply set up a new scene with similar lighting and render each object separately with the "Show Render in Progress" option turned on. This is a bit more labor intensive than other preview methods but the pay-off is that you can be 100% certain your objects will look correct when you render out the final animation. Just be sure to save the object after making any changes to the surface attributes!

Q: Reference Nulls in LightWave5.5 make it very easy to precisely position and rotate a texture on my objects, but I find it confusing to have the Reference Nulls just sitting in the middle of my scene. If I parent the Reference Null to the object it's referring to, then the texture slides off the object if I move it. How can I avoid this?

A: One way to hide your Reference Nulls is to simply go to the Scene panel and turn off the display options for each Reference Null but a much better way to handle this problem is to parent the Reference Null to the object it is referring to then turn on World Coordinates in the texture control panel. This will keep your texture positioned correctly on the object and your scene won't be cluttered up with Reference Nulls.

Q: I have booleaned some objects together and then used Merge Points to clean up the final object but when I render this object there are a number of 'broken' polygons where the boolean operations took place. Why is this happening and how can I fix it?

A: Boolean operations are notorious for leaving behind 1 and 2 point polygons, which may create render errors. To eliminate these errors, simply switch to polygon selection mode and press the 'w' key to bring up the polygon statistics window. You should see a number next to the '1-point' or '2-point' polygon listing. If so, then click on the '+' button next to this number to select these unwanted polygons and then delete them.

Your object should render correctly now but if the problem persists then the Merge Points operation you performed may have missed some points. Try running Merge Points again but with an Absolute value that will ensure any overlapping points will be merged correctly this time. It is a good idea to save your object before doing this, just in case you inadvertently merge some points that shouldn't be merged.

That's all I have room for this time around but join me again in the next issue for more OnTopic discussions from the LightWave mailing list.

About the Author: David Warner produces the "TutorVision 3-D CD" series of interactive, multi-media CD-ROMS for LightWave animators. For more information about the LightWave mailing list and/or TutorVision3D, please visit the Event Horizon Studios web site at:
http://www.tv3d.com
or send snail-mail to:
P. O. Box 310
New Baltimore, NY 12124.

(Review : Super Glow & Surface Effectors - continued from page 12)

Let's take a closer look at the package. An effector has to be assigned to a surface in order for it to work. In older versions of the program, you used to have to define the effector's parameters in the Null name, but there's now a program interface. This makes the program much, much easier to use, and is a very welcome addition. After you create an effector and give it a name, you assign its properties in this panel. Each effector has the ability to replace, add, subtract or multiply its parameters with the selected surface. The parameters that an effector can control include color (both RGB and HSV values), Diffuse Level, Luminosity, Specularity, Reflectivity, Transparency, Index Of Refraction and Edge Softness. This in itself is a lot of power, but there is a lot more to the package.

Many parameters can have additional effectors assigned to them. These "children" can further control the individual parameters controlled by the "parent" effector. For example, a child can be set to control just the Saturation value of the color that the main effector is controlling. Or a child effector could change the transparency value of the main effector. Almost every parameter allows for the ability to add additional effectors for even more control. Again, the power of this system is amazing, and is really only limited by the user's imagination.

Effectors can also be set to fade, sharpen or soften their effects on surfaces. They can be tagged so that they only effect surfaces with the corresponding tag number. The effectors can also be set to leave dynamic trails, allowing for the creation of logo trails, laser burns, tire skids and other effects. It is also possible to use a new fractal noise texture to alter the look of an effector's output. This fractal noise, like almost everything else in the package, can be animated. Finally, the plug-in works with the Super Glow plug-in.

As you can see, Surface Effectors is one powerful plug-in. This review really just brushes the surface of its capabilities. The package's flexibility is amazing. It is fairly easy to use, too; though it will take some time and patience to master all of its features. If you run into problems, I have found the developer to be very quick to respond to e-mail questions (the preferred type of tech support). Surface Effectors is under constant development; so who knows what amazing effects will show up in future versions? It's inexpensive, extremely powerful, and easily capable of creating effects that would be almost impossible without it. Go get it!

Dave Thomas owns and operates Pixel Planet. You can visit his web site at:

http://www.pixelplanet.com

Companies Mentioned

Prem Subrahmanyam Graphic Design
Surface Effectors $99.95
904-575-6051

Pontari Productions
SuperGlow $50.00
206-702-0262

TECTONICS

A Study In 3D Construction

By Kyle A. Thatch

"The Devil And The Details"

This issue we take a look at two of the most overlooked areas of 3-D Animation. Don't let the title fool you. I am not going to ask you to join a cult or anything (Jeesh). Instead, what I am going to do is ask you to consider the following: How many times have you seen someone else's animation and wondered, "WOW !! That really looked awesome !! Nine times out of ten what made that particular animation look great was one of two things; the models and the surfacing. That is what I refer to as the 'Details'.

The Copper Top Battery

Let's start by going to the TECTONICS Directory included on the LightWavin' CD-ROM and load "Battery-Profile" from the objects directory. Next, we want to Lathe it using 'Y' as the axis, 60 for number of Segments and 360 for End Angle. Notice how much detail there is in something as simple as this battery. What detail you might ask? The detail in the battery includes things like the smooth corners and small details on the top and bottom of the battery. Take a look at *Figure 1.* Notice the difference in the two batteries ?

The next step in adding detail to this battery is the art of naming and defining Surfaces. Begin by selecting the upper part of the battery, the copper part on the side only. You should have 60 polygons selected. Name these polygons 'CopperTop-Smooth'; while you are in the surface requester don't forget to turn on smoothing. If you like, you can give the surface an orange type color for now just to make sure you selected the right areas. Now select the polygons below the area you just selected and name this 'Black-Smooth'. Here comes the tricky part. There is a small lip at the top and bottom of the battery that need to be selected and added to 'CopperTop-Smooth and Black-Smooth' respectively.

You could have selected these two areas when you where selecting the sides, but I wanted you to see the devil in the detail. Start by dragging out the Face View and zoom in on the top of the battery (*figure 2*).

Now select the top lip of the battery. Next, drag out the Top View and deselect all of the inner polygons. Now simply name these polygons 'CopperTop-Smooth'. Repeat this process for the bottom lip and add the selection to 'Black-Smooth'. Things start to get a little hairy now. You hear people say all the time to keep your polygon count low for rendering purposes. What does that mean exactly? Basically, what they mean is to reduce or do away with polygons that are not necessary. To illustrate what I mean, select the center most part of the battery in the Top View (*Figure 3*).

Make sure that you only have the top of the battery selected. Now merge the polygons so that you are only left with one. You did not re-

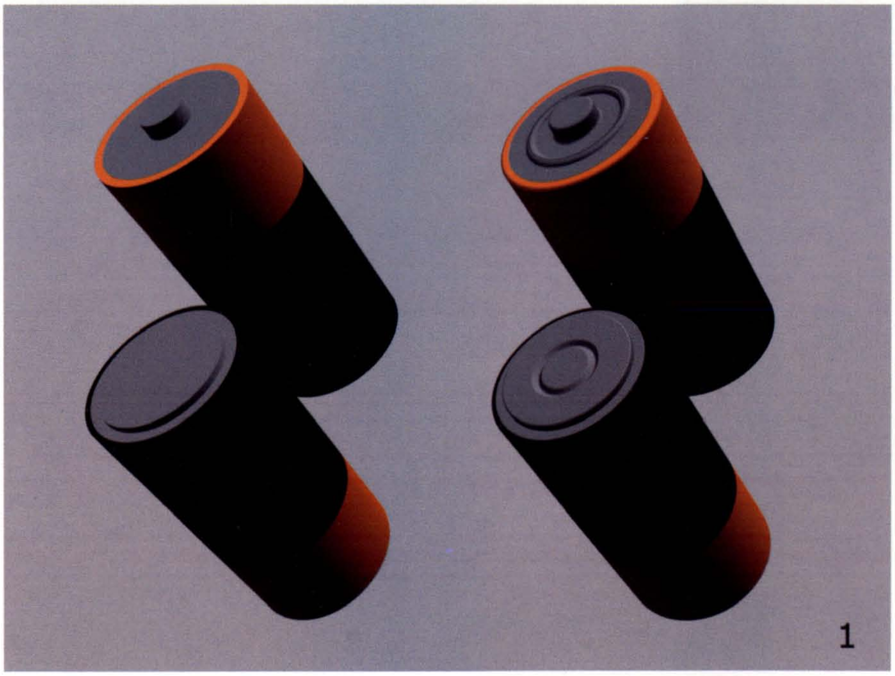

Figure 1

ally need 60 polygons to makeup a flat surface right? While you have that polygon selected name it 'Top-Flat' and give a gray color to distinguish it from the rest of the battery.

Using Figure 4 as a guide, select and merge the rest of the areas that are flat and have more polygons than needed to make up their surfaces. Use the naming conventions in figure 4 to name the new surfaces. After you have named all of the flat areas you need to select the remaining polygons and name them 'Top-Smooth and Bottom-Smooth'. Once again refer to figure 4 for direction.

HINT: If you hit the (w key) while in polygon mode, it will bring up polygon statistics. Select 'default' from the selection window and hit the plus key next to this surface name. Everything that has not been given a surface name is selected. Now simply deselect the bottom of the battery and name the top of the battery surfaces. That's right, repeat the process and you should be left with only the bottom of the battery.

Before continuing you need to delete two points that are located in the center of the object (*Figure 5*). If you named and surfaced everything right thus far, your battery should look like the battery in figure 1. If not...*PANIC!!* No, don't panic, it's not worth it. Just go back and repeat the tutorial to this point...if you still don't get the results in figure 1, then PANIC!

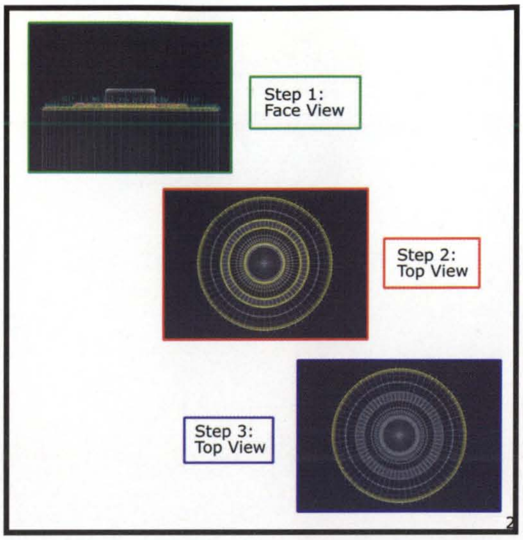

Figure 2

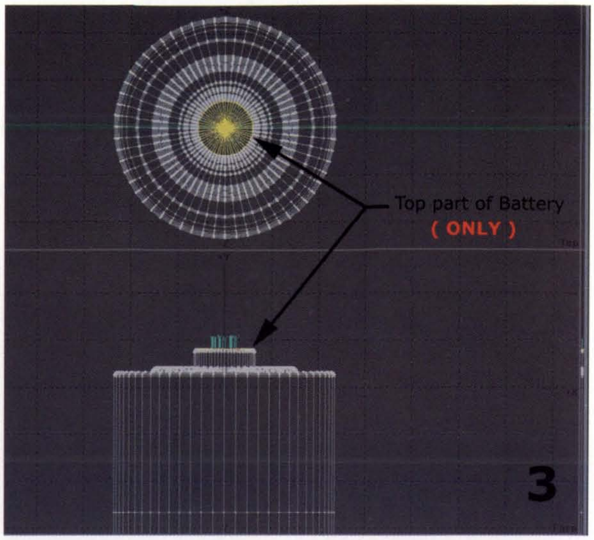

Figure 3

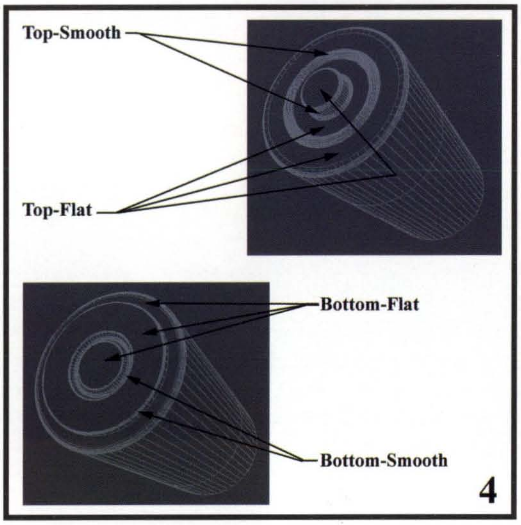

Figure 4

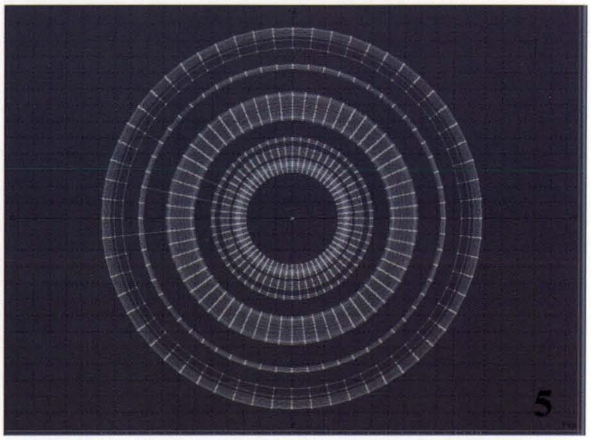

Figure 5

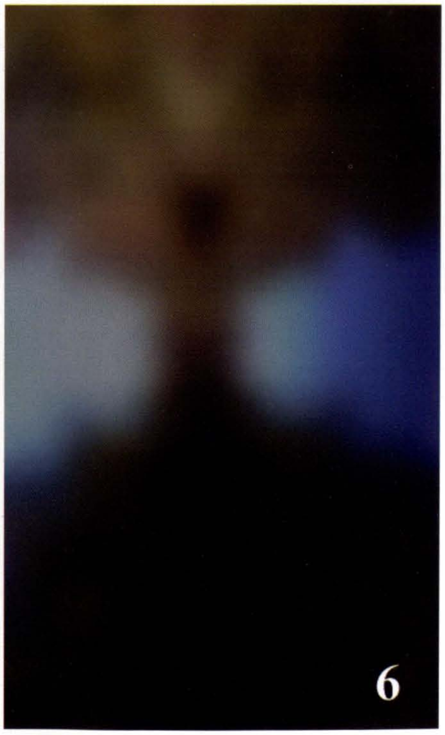

Figure 6

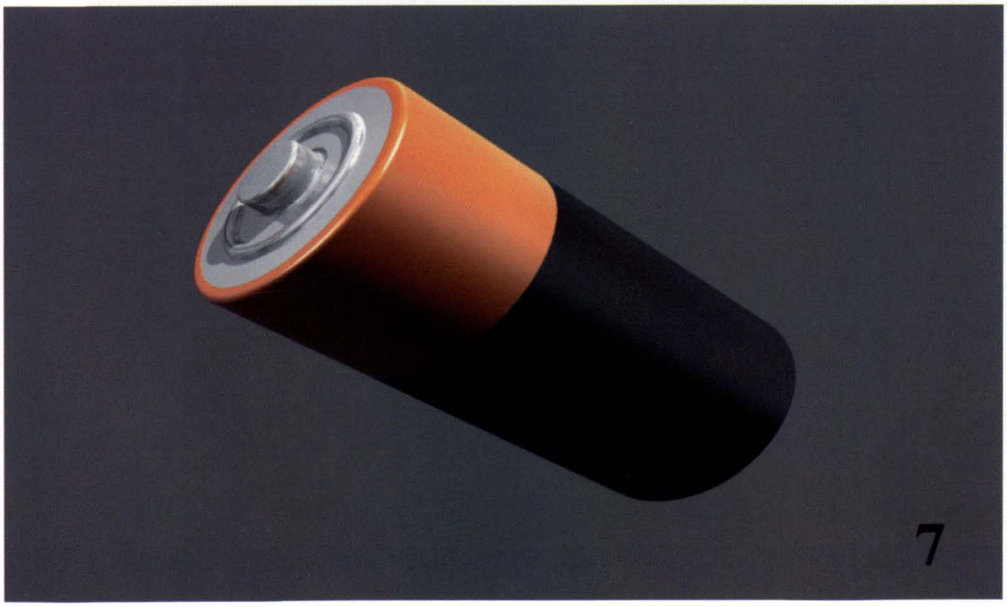

Figure 7

Before you can continue, you need to save the battery as; 'Battery.lwo'.

Our Next Contestant Is

So far we have talked about details in the model that give the battery a realistic look. Next we are going to talk about the 'Devil'. The devil in this model is Specularity and Reflectivity of the surfaces that make up the battery. Let's begin by entering Layout and loading your Battery Object. Make sure you have the following surfaces:
Black-Smooth
Bottom-Flat
Bottom-Smooth
default (you will not use this one)
Top-Flat
Top-Smooth

If you do not have these surfaces, you did something wrong in Modeler when you were selecting and naming your surfaces. Before we can start to surface our battery, we need to create an image to reflect on our battery surfaces. What you need to do is take the "River.iff" image that comes with LightWave and modify it. All you do is load the image into PhotoShop or PaintShop Pro (or whatever paint program you have) and do the following:

1. Rotate the image 90 degrees Counter-Clock-Wise

2. Adjust the Brightness & Contrast

3. Using Blur, Gausian Blur it about 8 to 10 pixels…or until you get the desired results you want

4. Save the new image as; 'Reflection.iff'

Refer to *Figure 6* as a guide to making the reflection image. Once you have made and saved the image load it into Layout. Now load the 'FRACTALREFLECTIONS.TGA' from the LightWave/Images/Reflection directory. Some of you may be saying "Why is he going to use Fractal Noise when we just made this reflection image?" Fractal Noise is not a bad image to use if you use it properly. OK, go to the Surfaces Menu and select 'Top-Flat' from the list of surfaces. Enter the following settings:

Surface Color = R 200 G 200 B 200
Luminosity = 0.0 %
Diffuse Level = 75 %
Specular Level = 50 %
Color Highlights (Checked)
Glossiness = Medium
Reflectivity = 50 %

Reflection Options

Reflection Type = Ray Tracing + Spherical Map

Reflection Image =
FRACTALREFLECTIONS.TGA

After you have entered all of the above settings, render a sample of the surface. You do this by pressing render under the 'Samples' area of the Surface Menu. Now select 'Top-Smooth'. Did you render a test sample of the 'Flat' surface? If you did, then click your mouse pointer on the rendered sample and answer Yes when LightWave asks if you want to copy these surface values. Next turn on Smoothing. That's it, you have just surfaced the top of the battery. If you wish, render out a test frame to see what the battery looks like. If you are satisfied, let's continue and surface the bottom of the battery. You will use the rendered sample once again. Select 'Bottom-Flat' then click on the rendered sample and again, answer Yes. Now select 'Bottom-Smooth', that's right, click on the rendered sample and answer Yes. Don't forget to turn on Smoothing for this surface.

To finish surfacing your battery select 'Black-Smooth' then enter the following:

Surface Color = R 0 G 0 B 0
Luminosity = 0.0 %
Diffuse Level = 100 %
Specular Level = 100 %
Color Highlights (Un-Checked)
Glossiness = Medium
Reflectivity = 35 %

Reflection Options

Reflection Type = Ray Tracing + Spherical Map

Reflection Image = Reflection.iff

Make sure you have Smoothing selected, then select CopperTop-Smooth and enter the following:

Surface Color = R 252 G 134 B 70
Luminosity = 0.0 %
Diffuse Level = 100 %
Specular Level = 100 %
Color Highlights (Un-Checked)
Glossiness = Medium
Reflectivity = 35 %

Reflection Options

Reflection Type = Ray Tracing + Spherical Map
Reflection Image = Reflection.iff

Before you go any further make sure you save your object using the 'Save All Objects' button in the Object Menu. Why do you save from this menu with this button? Simple. If you do not, LightWave will not save the surface attributes of the object we just surfaced. It is a good habit to save all your objects in Layout once they have been surfaced using the 'Save All Objects' button.

Lights...Camera...Action

Let's complete this lesson by setting up the scene. Add 2 more lights to the scene and enter the following positions for each:

Light # 1 X = 30.2358 cm Y = 54.075 cm
Z = -33.6971 cm Light Intensity = 100 %
Light # 2 X = -50.0609 cm Y = 11.6 cm
Z = -36.9426 cm Light Intensity = 50 %
Light # 3 X= -4.8777 cm Y = 46.275 cm
Z = 38.9362 cm Light Intensity = 25 %

Make sure you Create Keyframes at frame 0 for each light before continuing, otherwise you might not get the result we are after. Also make sure that you Target each light to the Battery. Next let's position and Create a Keyframe for the Camera:

Camera X = 0.0 Y = 0.0 Z = -9.6003 cm

Don't forget to Target the Camera to the Battery. Here are the Camera and Rendering settings for those of you who might be interested:

Basic Resolution = Medium
Pixel Aspect Ratio - D2 (NTSC)
Segment Memory = 10000000
Antialiasing = Enhanced Low
Adaptive Sampling = (Checked)
Sampling Threshold = 16
Rendering Mode = Realistic (DUH!)
Trace Shadows = (Checked)
Trace Reflections = (Checked)
Render Display = Full Size Window
Background Color = R 100 G 100 B 100

Having done all this, does your Battery look like the one in *Figure 7* ? Save the scene as 'BatterySetUp.lws' in the directory of your choice.

Wrapping Up

I hope that you have enjoyed this installment of TECTONICS. On the LightWavin' CD-ROM you will find the Battery-Profile and BatteryLowRes objects. I did not include, however, the completed objects. Why? If I did, there would be no reason for you to do the tutorials. Also included is an AVI animation of the Battery rotating, plus all of the Figure Images called out in the tutorial. Next issue we will discuss some interesting Tips and Tricks that will help you in your Animation endeavors. If you have any suggestions for future issue's let me know. Until next time, good luck in your modeling adventures and thanks for reading.

Kyle A. Thatch is President of MAGI Imaging a Louisville, Kentucky based 3-D Animation and Post Studio.

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http://www.mindspring.com/~bandicoot/

(Siggraph Review : Continued from page 10)

your effect will look like without rendering a scene. It also works with field rendering (unlike LightWave's native glow). This is a nifty effects package, and is worth checking out.

If you have a big rendering job to get done in a small amount of time, The Asset Factory may be able to help you. This company offers an Internet accessible render farm, where you can send your scenes via secure FTP. They render on their system, and then output onto the media of your choice, including CD-ROMs, tape cartridges or videotape. Asset Factory offers a lot of extra features, like being able to check on your job as it renders, and look at images from the rendering. Besides LightWave, the Asset Factory also supports rendering for Softimage, 3D Studio Max and Adobe After Effects.

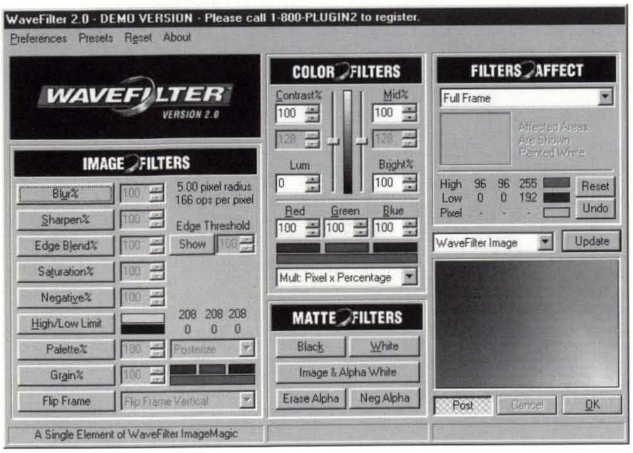
One of the contenders in the growing 3D-paint package market is 4D Paint from 4DVision. The package has all the features you'd expect in a paint program, and includes special features like being able unwrap a 3D image onto a 2D plane, control over mutiple light sources for accurate previews of a 3D painted object, and the ability to paint in multiple layers in real time. The program supports many 3D-object formats, including LightWave's.

Blevins Enterprises was in the NewTek booth showing off a couple of different products. Their VertiLectric plug-in is a great way to add lightning effects to your animations. The newest version, 1.1, is now shipping. The company also showed VertiTilities, a collection of plug-ins for Modeler and Layout. The Modeler plug-ins include Mirror (mirror an object around a point, line, plane or sphere), Midpoint (split polygons, weld them and create a new center points), FitTo (fit an object to a line, plane or sphere) and Populate (export a set of points into Layout as nulls, lights or objects). The Layout plug-ins include Film Grain, Blur, Color Gradient and Brush and Pencil (rendered output that looks like an artist's brush or pencil work). Each plug-in can be purchased separately for $20; the whole set sells for $150. Demo versions of all the plug-ins are available from their web site.

Over at the Unlimited Potential, Inc. booth, the company was showing the upcoming version of WaveFilter ImageMagic. This update of the popular plug-in WaveFilter, lets you process LightWave images and perform all sorts of special effects. WaveFilter Depth lets you add depth of field effects to your renders with much shorter render times. WaveFilter Shader adds the ability to perform all sorts of special effects on your images, including Transparency, Negative, Posterize, Transparency, Black & White effects and many more. Finally, the WaveFilter Volume portion of the package lets you add fog, clouds and fireball effects to your LightWave scenes. The program should be shipping soon.

Dynamic Realities was showing their full line of plug-ins, and some previews of upcoming products. Products shipping now include the shader package Shaderman (Shaderman 2 is supposedly in the works), the animation utility Lock And Key (dynamic parenting of objects and more), and the LightWave scene exchange utility, Stripper. The company is working on a new version of Impact, the dynamics package that works with LightWave (it may include "soft" dynamics). They also previewed the next version of Particle Storm, which looks interesting. The feature that should interest everyone is "strands" which can be used to simulate hair. There will be a bunch of other improvements to the package, and the upgrade should ship before the end of the year.

If you have any interest in working with landscape data, then you must check out World Construction Set (WCS) from Questar Productions. This program gives you complete control over all sorts of landscape parameters (trees, rocks, clouds, water and waves). You can export WCS landscapes to LightWave, or use Z buffer compositing to combine WCS and LightWave scenes. The company announced the next version of World Construction Set at the show. It has a lot of new features, including Terraffectors, which let you place features like roads directly on your landscape, reshape terrain, place trees exactly where you want them and create your own lakes. It also adds illumination effects and shadows that do not require ray tracing. The new version of WCS should ship by the end of the year.


WaveFilter 2.0 - DEMO VERSION - Please call 1-800-PLUGIN2 to register.
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VERSION 2.0
IMAGE FILTERS
Blur%
Sharpen%
Edge Blend%
Saturation%
Negative%
High/Low Limit
Palette%
Grain%
Flip Frame
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166 ops per pixel
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Image & Alpha White
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Neg Alpha
FILTERS AFFECT
Full Frame
Affected Areas Are Shown Painted White
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A Single Element of WaveFilter ImageMagic

LightWave wasn't confined to the NewTek booth at this year's Siggraph. It showed up running on a variety of machines, including computers from Intergraph, Digital, Sun and others. Also at the show was an impressive fake film trailer titled "Rocketman" that was created with LightWave. Sun used it to demonstrate the power of LightWave; and it ran constantly in the Sun and NewTek booths. Compared to animations running in other booths, the LightWave effort stood up well. It was another good show for NewTek and LightWave, and if any of the rumors I heard at the show were true, really interesting things are in store for the future.

Companies mentioned

4Dvision
5500 Greenwood Plaza Blvd.,
Suite 225
Englewood Colorado 80111
Tel 303 843-9400
www.4dvision.com

Asset Factory
1235 Pear Ave.
Suite 103
Mountain View, CA 94043
415-694-7966
www.assetfactory.com

Blevins Enterprises, Inc.
121 Sweet Ave.
Moscow, ID 83843
800-205-5161
bei.moscow.com

Desktop Images
P.O. Box 10908
Burbank, CA 91505
818-841-8980
www.desktopimages.com

Digital Image Design Incorporated
72 Spring Street
Sixth Floor
New York, NY 10012
212-343-2442
www.didi.com

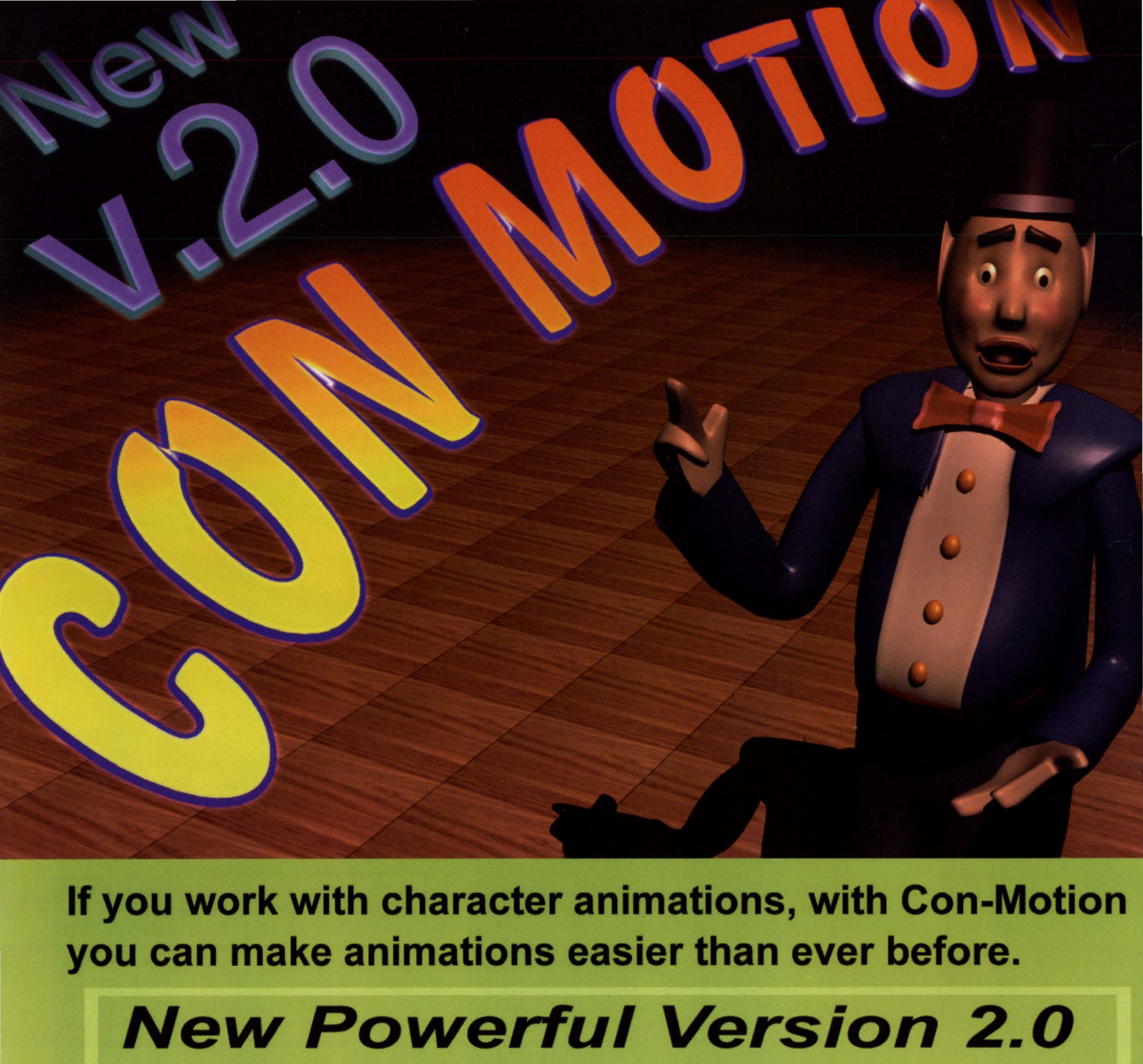
Dynamic Realities
1900-A Peweaukee Rd.
Waukesha, WI 53188
414-549-2200
www.dynamic-realities.com

NewTek
1200 SW Executive Drive
Topeka, KS 66615
913-228-8000
www.newtek.com

Positron
2605 S. 156th Circle
Omaha, NE 68130
402-330-7011
www.3dgraphics.com

Questar Productions
1058 Weld County Road 23.5
Brighton, CO 80601
303-659-4028
www.QuestarProductions.com

Unlimited Potential, Inc.
11608 W. 127th Terrace
Overland Park, KS 66213
913-685-2700
www.wavefilter.com



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COMPANY PROFILE

UNLIMITED POTENTIAL INC

Company: Unlimited Potential, Inc.

Date Company Founded: Founded 1993 by Mike Reed, Incorporated in 1995. Originally consulting and design of custom hardware and software for viaried industries. In July 1995, switched full focus to development and marketing of LightWave 3D based plugins.

Key Employees:

MIKE REED - Director of Research and Development. Mike is a self-taught electronics, microprocessor, hardware and software guru. He chose to get a GED rather then finish High School. At the age of 15, Mike purchased a TRS-80 and taught himself BASIC, Z80 machine language and Assembler. From that time forward, he has owned and programmed on almost every type of microprocessor based computer system. Mike has developed business systems, industrial control systems, artificial intelligence systems, compilers, code generators, interpreters and much more. He has programmed in many languages and believes the best tool for any job is the one that gets the job done. Mike has also had the high honor of teaching hundreds of people to program computers starting when he was just 18 years old.

From early on, Mike had a keen interest in combining TV and computer graphics. So, when the LightWave 3D plugin environment was added, Mike, a long time LightWave 3D user on the Video Toaster, was the first to jump on the LightWave 3D Plugin Developers team.

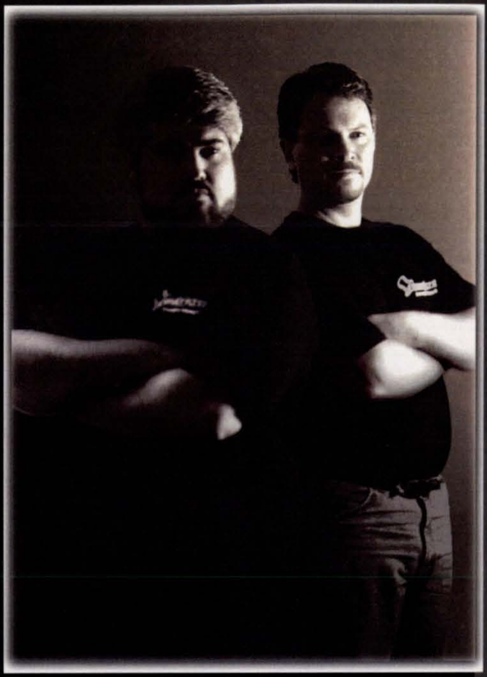
Within three months, Mike released the first version of WaveFilter at the VTU Expo in Hollywood. From that time forward, Mike has focused all his efforts toward pursuing the dream encapsulated in the slogan, "Creative Minds Developing Innovative Tools for 3D Artists".

TRAVIS WILLIAMS - Creative Director. Travis worked for several years as an art director for a Kansas City studio producing brochures, logos, product illustrations, catalogs and magazines. In 1994, he was hired by a major real estate company to produce their international magazine and marketing materials.

It is here where Mike and Travis were first teamed together to produce a graphical order-entry application. In 1995, while working as a freelance art director, Travis started consulting with Mike on the production and marketing of WaveFilter plugins and, in January of 1997, joined Unlimited Potential, Inc. as the full-time Creative Director. Travis is responsible for the overall creative direction and assists in the marketing and production of the Unlimited Potential CD and the WaveFilter plugin line.

What are your current products and why were they created ?

WaveFilter started as a way to batch color correct frames digitized on a video flyer system. Tools were added based on two simple criteria: 1) It had to be quick to develop - this market changes too much to spend more than a few months developing any one plugin. 2) It had to serve a useful general need - the LightWave 3D consumer plugin market is simply too small to support highly specialized development. Plugins should be a helpful tool for nearly every scene.



What will you be working on in the future?

As we developed a marketing strategy to support our own products, we quickly learned that plugins, even extremely feature rich plugins only require a small percentage of a CD ROM. We also found that marketing and operations were the largest costs associated with producing and selling plugins. As we surveyed the market, we saw many plugin developers, some new and some quite famous struggle to profit and grow in this narrow market. But we love LightWave 3D and we wanted to remain in this market. To do that, we had to expand our horizons and look for a way to share the high costs of marketing and operations.

From this need, was born the Unlimited Potential CD. This CD works to put exciting tools in the hands of the 3D artists themselves.

Starting in the fourth quarter of 1997, we plan to mail CDs to as many registered LW owners as we can find. Artists will be able to use all of our plugins in a slightly disabled demo mode, then with a simple phone call or email, unlock the full potential of each tool.

But our larger goal is much grander in scale. We want to make the marketing and operations power we crafted for WaveFilter available to others. By sharing space on the CD with others, we make it possible for developers who have no way to market or handle orders to become part of the LightWave 3D plugin team. We hope to tap the unlimited potential that can be found in the software developer community by offering an opportunity for developers to focus on writing and supporting plugins, and not on production, marketing and the daily overhead of operations that quickly chips away at the bottom line. In many cases, the developer will pay no fees to get his or her tool added to our CD. If any developers are interested, please contact Unlimited Potential, Inc. for more detailed information on getting your tool included on the Unlimited Potential CD.

Our Slogan, "Our Office is the World"

We do not have a central office, nor do we have a place we call "WORK". We each create wherever we like, in a back room, basement or wherever our computer is. We each have an internet connection and spend most of our awake hours on the net, together, in a virtual office. We use email, faxes, phones, the web and FTP, but mostly we use the IRC. Using free software that is readily available on the net, anyone with an internet connection can join the #LightWave channel on the IRC EFNET. We use this channel for greater support for our products and to get input from some of the industies top animators. We have a private channel also, where we have company meetings and pass around latest versions of what everyone is working one.

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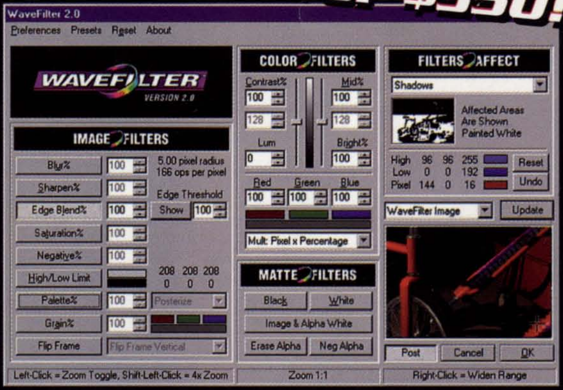

WaveFilter 2.0
Preferences Presets Reset About
WAVEFILTER VERSION 2.0
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Saturation% 100
Negative% 100
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Palette% 100
Grain% 100
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Posterize
Flip Frame Vertical
COLOR FILTERS
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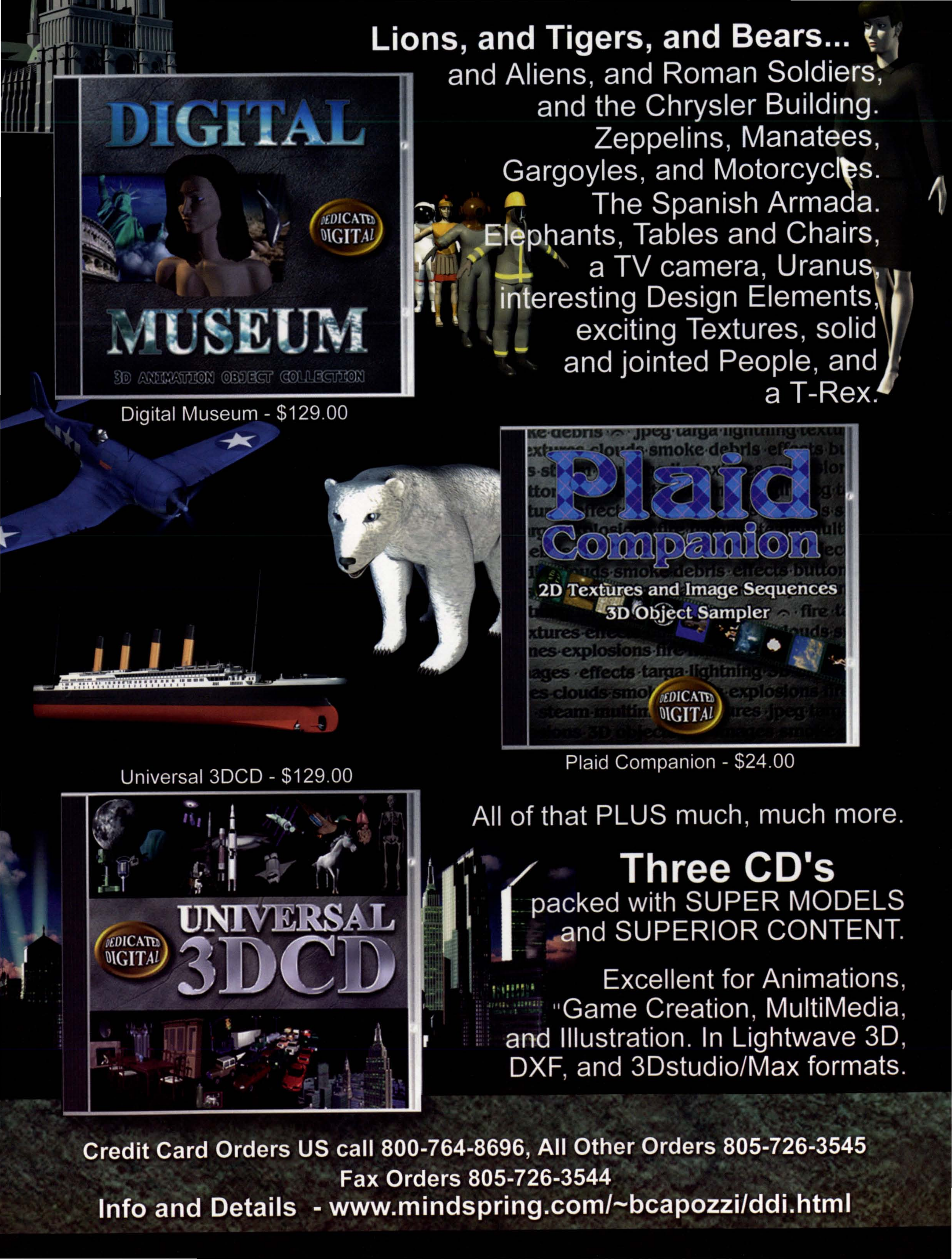
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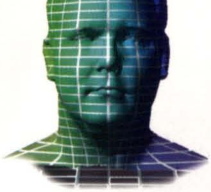


CHARACTER SHOP

BY DOUG KELLY

In issue #3, I presented a quick overview of snap, ease, anticipation, follow-through and overlap. In this issue, I'll be discussing weight, inertia and gravity, with an example character setup designed for fast, easy practice of all these timing principles. If you complete these exercises, you'll get a lot of practice in developing your sense of timing.

Keep It Simple

If you're going to learn character animation, you'll need to temporarily forget everything you know about detailed modeling, textures, lighting, and special effects "eye candy." Character animation is creating the illusion of life with a succession of poses. All you need is a simple armature or skeleton, something you can deform to create poses. Anything extra is a distraction.

Animating any character is a series of experiments, a process of animating tests, tweaking, and more tests. The big advantage of CGI character animation is that you can tweak timing very quickly, so you can experiment more. This is important when you are first learning character animation principles; you will learn most quickly by pushing the limits, breaking the "rules" of timing to see how they work. In traditional animation, these "mistake" tests would cost you weeks of effort and many feet of expensive film; with LightWave, these experiments cost you little more than the time to reset a few keyframes.

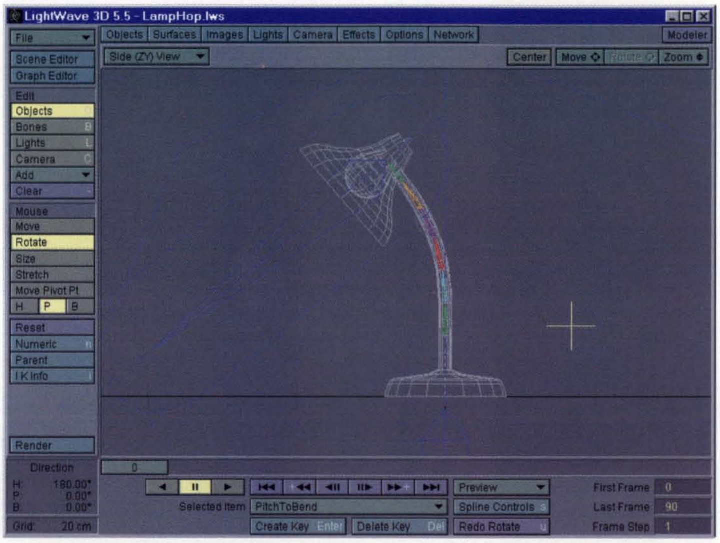
The faster your system gives you feedback, the faster you can learn from your experiments. A complex setup not only distracts you, it slows you down. If your system can't redraw the screen fast enough for you to use the scrub bar, you can't get a good sense of your timing unless you make a Preview, which slows you down even further. Keep your practice setups simple!

The practice setup LAMPHOP.LWS included on the CD-ROM is as simple as I could make it for an animator. This doesn't mean it's the simplest possible setup for the given range of actions, but that it is easier and faster to work with. Even though the scene includes several objects and a handful of Bones, to complete these exercises you will only have to animate four settings: the desklamp object Y and Z position and Pitch angle, and the PitchToBend null Pitch angle. With these four variables, you can animate an expressive character performing a variety of actions demonstrating weight, inertia, gravity, snap, ease, anticipation and follow-through. These exercises are based in part on John Lasseter's 1987 SIGGRAPH paper, "Principles of Traditional Animation Applied to 3D Computer Animation," especially those portions describing the animation of Luxo, Jr.

See Figure 1

The practice scene is built around the Desklamp object that is included with LightWave. I've placed a series of Bones for deforming the lamp: BaseBone to lock down the shape of the lamp's base, SpineBones 1 through 6 to bend the lamp's neck, and ShadeBone to lock down the shape of the lamp's shade. The Bones are an IK chain, and the ShadeTarget null is the goal. The IK Options are set so the SpineBones can't change Heading or Bank at all, and Pitch is limited to the range that allows the lamp neck to bend gracefully until the edge of the shade touches the ground. Finally, I parented the ShadeTarget null to the PitchToBend null, which in turn is parented to the desklamp object. The result is that you can animate the bending of the lamp's neck by Pitching the PitchToBend null between 0 degrees (normal upright pose) and 40 degrees (bending to touch the ground). Just select the PitchToBend null, make sure you're in Rotate mode, and drag the cursor up and down to pose the lamp's neck. This enables you to animate the lamp entirely in Object mode, changing only from Move to Rotate as needed. With the Bones and ShadeTarget null hidden, the Layout is as uncluttered and easy to use as I could make it.

See Figure 2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Delete Key Del
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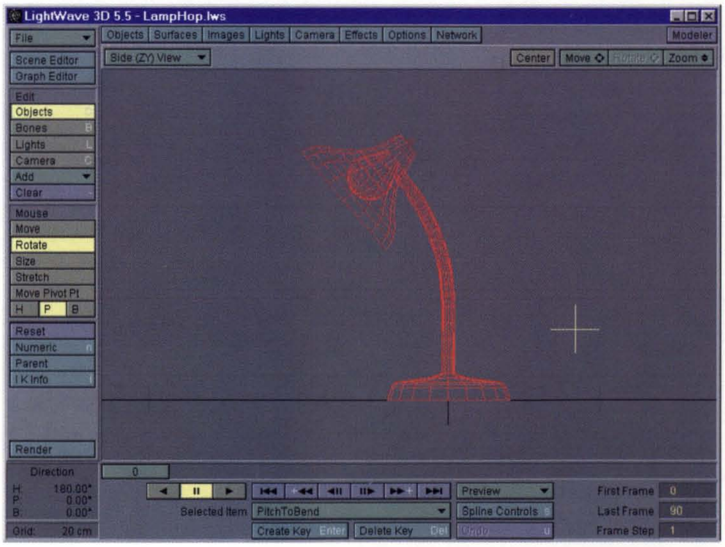
Redo Rotate
First Frame 0
Last Frame 90
Frame Step 1

FIGURE 1: Desklamp setup with Bones and Nulls visible.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Grid: 20 cm
0
Selected Item PitchToBend
Create Key Enter
Delete Key Del
Preview
Spline Controls
Undo
First Frame 0
Last Frame 90
Frame Step 1

FIGURE 2: Desklamp setup with PitchToBend control null visible.

This setup limits the lamp's range of motion, but if you want full control you can always disable the IK chain and go back to the time-consuming practice of posing Bones one at a time. For these exercises, you will only need to position the lamp and bend its neck in the YZ plane and Pitch it; it's essentially a 2D animation. I'm using such a simple character with a limiting setup to avoid the distractions and heavy workload of more complex characters. For example, the simplest humanoid character (an artist's mannequin) has at least 14 joints, so you'd have to keep track of 30 or more parameters for each key pose. That's just too much for effective learning, you'd lose sight of the forest because you'd be fussing about with too many trees. You shouldn't tackle a complex setup until you've mastered the principles of timing as they apply to a simple setup like this one.

Mass, Energy, Gravity, Inertia and Acceleration

To give the illusion of weight in an animation, LightWave objects must move in ways that simulate the mass and energy of the real-world materials they represent. Gravity, for all practical purposes related to character animation, is a form of energy that constantly tries to force objects towards the largest mass in the neighborhood, typically the ground. (This definition is not scientifically correct, but this is not a physics textbook.) The motion of an object is also governed by inertia, the tendency of objects to keep doing what they've been doing. If a large rock is just sitting there, it will continue to sit there until energy is applied to change it, perhaps by levering it over, dragging it away, or even shattering it into smaller rocks.

You can mimic mass and energy with timing. For example, let's look at one of the simplest actions, an inanimate object falling to the ground. The object is initially suspended in midair, with no motion relative to the ground. When released, it stays in midair for a moment. This is due to inertia; the object was motionless, inertia says it will remain motionless until something else acts on it. That something else is gravity, which overcomes inertia by pushing the object toward the ground at an *acceleration* of 9.8 meters per second, per second. This doesn't mean the object is falling at 9.8 meters per second; this means 9.8 m/s is added to the object's downward speed for every second that it falls. Leaving out incidentals such as updrafts or a character's intervention, you can figure the exact position of the object for each fraction of a second. The equation is: $Y=Y_s-(1/2gt^2)$, where Y is the y-axis height in meters, Y_s is the original Y-axis height in meters at the start of the drop, g is the constant of acceleration for gravity of 9.8, and t is the time in seconds since the start of the drop. In simpler form, it reads $Y=Y_s-(4.9t^2)$. If you calculate the distance for each thirtieth of a second, you have the Y-axis positions of the object for each frame of a second of animation, as in the motion graph in Figure 3.

If you mirror the motion graph, you get a parabola, as in Figure 4. The leading half of the graph describes the upward deceleration of a thrown object, the peak is the point where gravity overcomes the object's upward inertia, and the trailing half of the graph describes the object's fall back to earth.

See Figure 4

Once you know the approximate shape of the parabola you want, you can duplicate the effect of many calculated keyframes with relatively few well-placed keyframes and LightWave's standard interpolation.

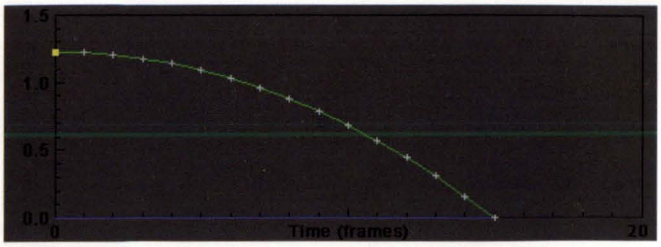

FIGURE 3. Calculated motion graph for falling object.

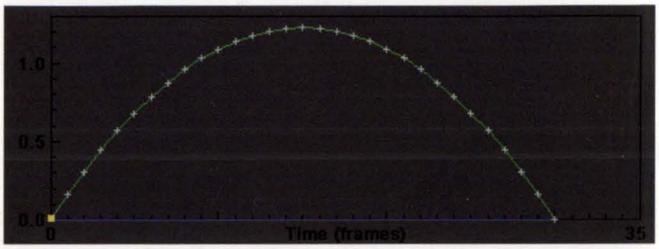

FIGURE 4. Parabola motion graph for thrown object.

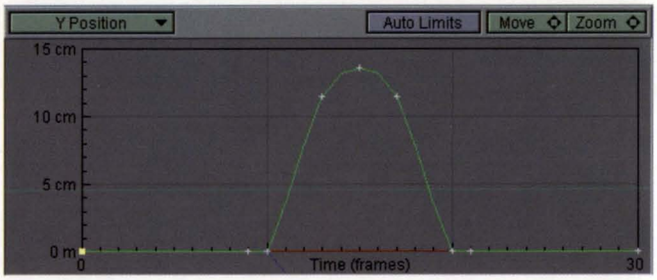

FIGURE 5a. Desklamp hop parabola for Y-axis and constant ramp for Z-axis.

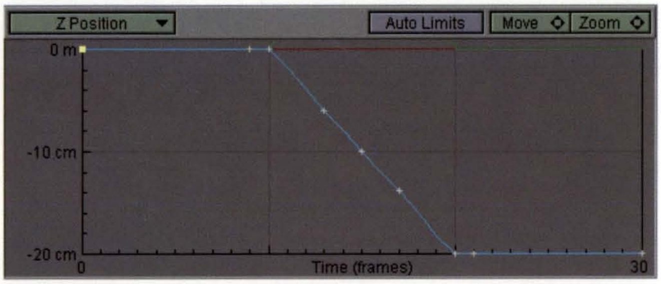

FIGURE 5b.

So far, these motion graphs only describe the object's Y-axis motion. The horizontal component of a typical parabola is very easy: once the object is in flight, the horizontal movement is constant. All you have to do is set the launching and landing coordinates in the XZ plane. Once you become familiar with parabolas and how to apply them, you'll find it easy to animate falling or thrown objects. Any object — including an animated character — describes a parabola while it's in midair, unless it's carrying rockets or some other source of energy to change its path. You can use the calculated values to create a realistic parabola, or exaggerate the acceleration and deceleration to create parabolas for caricatured actions.

Hop To It

Here's how you can create a realistic parabola for the desklamp's Y-axis motion graph. Load scene LAMPHOP.LWS, and select the desklamp. Set zero-value keys for the Y-axis at frames 0, 10, 20 and 30. This will lead off with ten frames of no action, then the parabola, then another ten frames of no action. Let's say we want the lamp to hop somewhere between 10 and 15 cm., a reasonable amount for its size. According to the formula, starting from

0 would give a drop of 13.6 cm in six frames, or one-fifth of a second. Close enough; try 13.6 cm at frame 15. Again referring to the formula, two frames' difference calls for a 2.2 cm drop, so try values of 11.4 at keyframes 13 and 17. LightWave's standard interpolation will push the lamp's base slightly below the ground before and after the hop; to correct this problem, set keyframes 9 and 21 to zero. For the lamp's Z-axis travel, you want it to move at a constant rate from frame 10 to frame 20, then stop. You should end up with motion graphs like Figure 6. Use the scrub bar, or make a Preview and play it back at different frame rates to study the motion.

See Figure 5

Now for the fun part! Using this realistic timing as a baseline, start playing around with the keyframes and values. This is the core of caricature, choosing an essential attribute of an action and exaggerating it. Try broadening the peak of the parabola to keep the lamp in the air longer, creating "hang time." Try making the ascent and descent parts of the Y-axis graph steeper, to exaggerate the effect of gravity. Increase the Z-axis values for frames 11-20, to make the lamp hop farther, or decrease it to shorten the hop. Play with these settings and make more Previews until you are familiar with their effects. Pay special attention to the apparent weight of the lamp; you'll find that the difference of a few frames can make it move like a balloon or an anchor.

The lamp looks a little funny, levitating through the air with a perfectly horizontal base. Let's give it a more reasonable action. In a normal walk, the heel of the foot always leads off, followed by the toes. To mimic this, the trailing edge of the lamp base should leave the ground first and then land first at the end of the hop. That means the lamp base will have to Pitch forward, then back, during the hop. The simplest way to do this is to Pitch the lamp forward at frame 13 (just before the peak), and backward the same amount at frame 17. The existing keyframes at the beginning and end of the hop will take care of leveling the lamp. You might start off with Pitches of -20 and 20 degrees, but again you should experiment with these values to learn how far you can exaggerate them for caricature action.

Boing!

So far, you've animated the lamp to follow realistic and caricatured paths to simulate a hop. However, the lamp has remained rigid, so the animation appears to be of an inanimate lamp being thrown by an invisible force. What you need is a way to make the lamp look as if it is moving itself. A lamp like this might hop by bending its neck as far down as possible, then suddenly straightening, using the upward inertia of the shade and neck to pull the heavy base into the air. This requires three key poses: the default pose at the beginning of the action, a bent pose, then a fully-extended pose at the first frame of the hop. You can make these poses simply by Pitching the PitchToBend null, about 15 degrees for the default pose, 40 for bent, and zero for fully extended. The real trick — and what you should practice — is where to put the bent pose, and how to shape the motion graph between the three key poses. For starters, the bend should happen more slowly; it's an anticipation, like a pitcher's windup, and the straightening is the release, which should be as fast as possible. Once the lamp is airborne, the extended neck should relax or, to pull the base even higher, bend again very quickly. This should happen around the top of the parabola, and may only need a single keyframe. Finally, the neck should stretch out again as the lamp descends, in preparation for impact. Immediately after the base hits the ground, the neck should bend nearly to its limit in follow-through. Timing on this part of the

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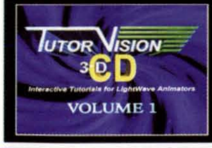

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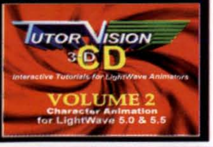

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action is important to show the weight of the shade and the resilience of the neck. A very small bend shows a stiff neck and a lightweight shade, a deep bend shows a heavy shade and a looser neck. If you want to show both a stiff neck and a heavy shade, the neck should oscillate between bent and extended several times before coming to rest. This is easier than you might expect; the neck's oscillation is essentially a pendulum, just using a spring instead of gravity. Any pendulum has a constant period (the number of frames between extreme poses) and the values for the extremes diminish at a constant rate. For example, the lamp neck could oscillate with a period of three frames, with values diminishing by half in each cycle. This is easier to see in the Motion Graph than it is to calculate, so take a look at Figure 6.

The values shown give a fairly stiff neck, as you can see in FIGURE6.AVI on the CD-ROM. If you reduce the falloff rate of the extremes in frames 25-51, the neck will appear to have more "spring." A pendulum's period depends on its mass, so if you change the interval to 5 frames rather than 3, the shade and neck will appear to be heavier. Play with these settings until you have a good feel for the lamp's weight and resilience. Try to create at least one animation with realistic weight, another with very light weight, and a third with very heavy weight. Try variations of the neck's stiffness, as well.

See Figure 7

Boing, Boing, Boing!

Now I'm going to challenge you a bit. You should have a good feel by now for the timing of the lamp's hop and the follow-through oscillation on the landing. So, how would the lamp make a series of hops? If it were moving slowly, it might wait out the oscillation, then start a completely new hop from a standstill. If your animation is like Figure 6, that means the lamp would only hop about once in two seconds. If the lamp wanted to travel faster, it might use one of the follow-through oscillations as part of the anticipation for the next hop.

Try this: animate the lamp through a series of tests, each animation having a different spacing between the end of one hop and the beginning of the next, and each animation containing at least four hops. The first animation should wait until the oscillation is completely damped out before starting the next hop; the last animation should look very fast and frantic, with the initial follow-through (frame 22 in Figure 6) serving as the anticipation (frame 8) for the next hop. Don't forget to save different versions of the scenes when you make changes, so you can compare settings later.

By this time, you're probably appreciating the advantages of this setup. When you start making this many changes to an animation, the fewer variables you have to manage, the better.

Your characters won't always be moving over a smooth, level surface. Here's a chance to practice dealing with obstacles, stairs and other surfaces. Add the Steps.lwo object to the scene, and animate the lamp hopping up and down the steps. Experiment with different hop heights and speeds, and hopping off the single-step and double-step sides of the Steps object. You should recalculate the realistic values of the lamp's Y-axis positions when you first try a different parabola height, but that's just a starting point. See how far you can exaggerate the speed of a longer fall, a deeper follow-through bend on landing, and a deeper anticipation for a higher hop. On the other side, you'll need a shallower anticipation when the lamp is descending the stairs; it only has to hop far enough to clear the edge of the stair, the rest of the parabola is a fall. You'll find, again, that a single frame's difference makes a dramatic change in the apparent weight of the lamp and stiffness of the neck. One possible timing is shown in HopSteps.AVI on the CD-ROM.

Acting

Now that you've got a good feel for moving the desk lamp around, it's time to make that lamp show a little real character. It doesn't have a face, hands, or even shoulders to shrug, but if you try you can get a surprising amount of nonverbal communication out of it. If you review the animations you created in the preceding exercises, you'll notice a definite difference between the faster hops and the slower ones. Doesn't it seem that the lamp has a lower energy level in the slow hops, and in the fast ones it appears to be hyperactive? Those same differences in timing can be used to show emotions.

For example, you can change the emotional content of a simple hop by changing one keyframe. Open one of the scenes you saved earlier, with the widely-spaced hops. Shift all the keyframes to give you another ten frames working space at the beginning, then change the initial anticipation to take those extra ten frames. Make and play a Preview of just that

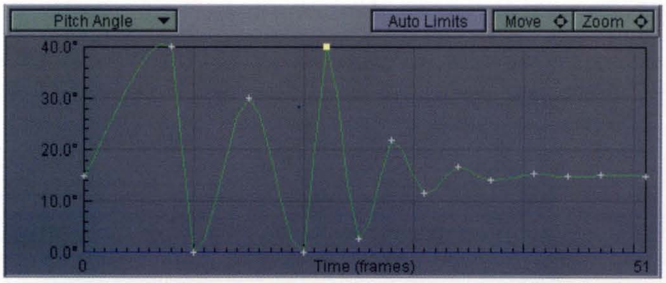


FIGURE 6: PitchToBend motion graph

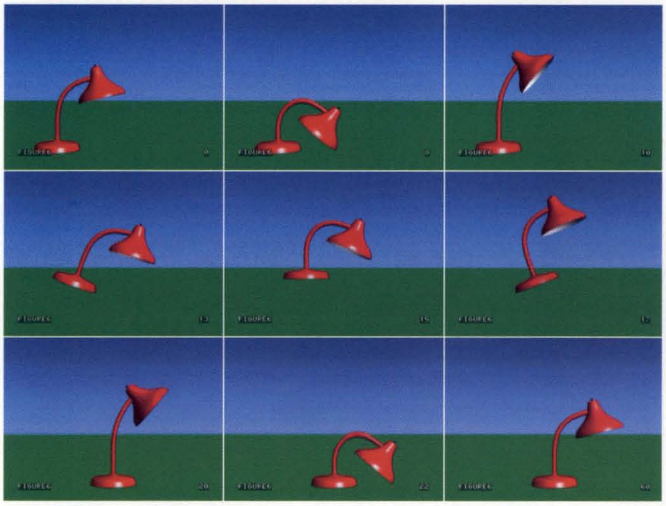


FIGURE 7: Key Poses from FIGURE6.AVI

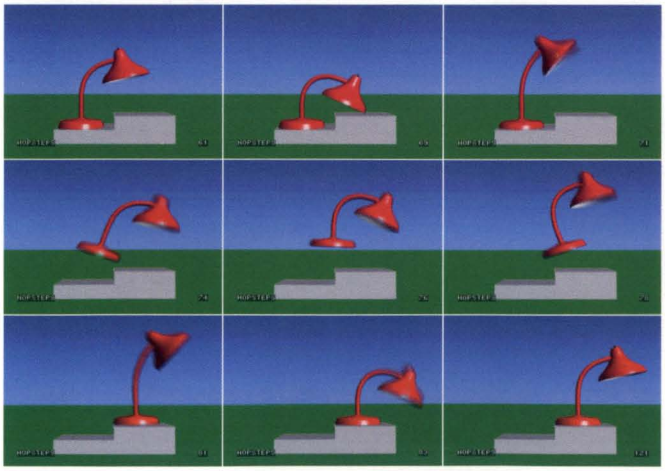


FIGURE 8: Key poses from HopSteps.AVI

first hop, and look at the difference the extra ten frames make. The lamp looks almost exhausted; even though the rest of that hop had exactly the same timing, the slow, drawn-out anticipation completely changes the audience's impression of that character.

In addition to changing the timing of the hops, you can use the neck's bending to communicate other emotions. You can simulate a deep sigh by slowly straightening the neck, then bending the neck to an angle somewhat below the default of 15, as if the lamp is slumping. Experiment with this to find the settings and timings that "read" best for you. This is also a good point for you to practice acting out actions to experiment with timing. Give a deep sigh or three, yourself, and pay attention to what your spine, shoulders, neck and head are doing. How much of an angle is necessary to look dejected? How fast do you inhale, how long do you hold it, and how long is your exhale? When in doubt about pose or timing, you should always go back to observations from real life. Try animating a series of your slowest hops. After every second or third hop, add a deep "sigh" and an extra-slow anticipation for the next hop.

When in doubt about pose or timing, you should always go back to observations from real life.

How about animating a startled or frightened lamp? Try this: from a neutral pose, straighten the neck to about 5 and hold it for a moment. Very rapidly bend it to about 10, then straighten it to zero in just one frame, and make the lamp hop backwards with the neck held at full extension. You might even make it hop backwards several times, keeping it on the back edge of the base. Again, experiment with the timing and poses to study how far you can push their limits.

Next Level

You can repeat, modify and elaborate on these exercises to continue practicing your timing. When you feel you've exhausted this setup's possibilities, you can take it to the next level by disabling or modifying the IK options to increase the range of motion for the shade and neck. This will enable you to make the lamp nod, shake its 'head,' look around, and generally be more expressive. Keep in mind, however, that every time you remove or modify one of the limits I've built into this scene, you are adding another variable that you have to keep track of while animating. As an example, you might try recreating the first hop exercise with the IK options completely disabled. Posing the neck's six Bones for every key pose consumes a lot more time than simple Pitching the PitchToBend null! When you are considering an animation, think about what flexibility you really need, and what controls you will have to manipulate to maintain that flexibility. It's generally best to keep it simple; you can always add complexity later, if you really need it. I think you'll also find that animating within strict limits encourages you to be more creative, especially in getting your characters to be emotionally expressive with a minimum of movement.

Immediately following this column is an article which you might find interesting. It talks about getting your animations to tape.

As always, if you have any questions, drop me an email at dakelly@earthlink.com. Until the next issue, PRACTICE, PRACTICE, PRACTICE!

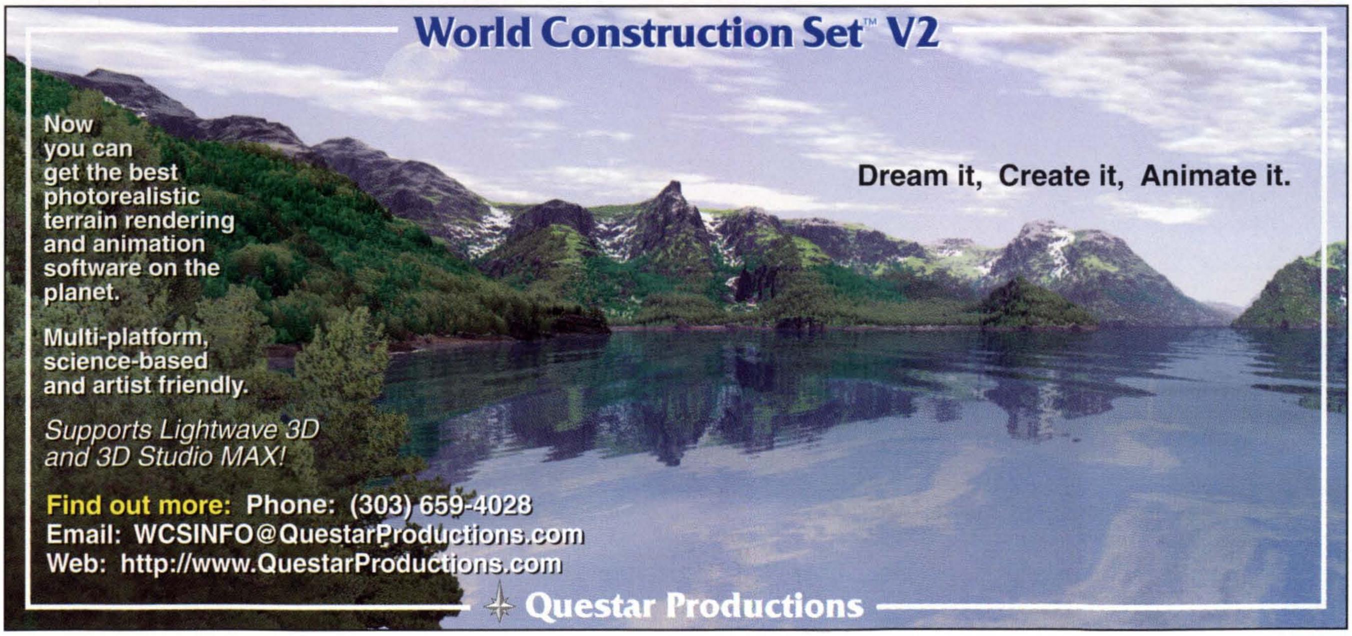
That's A Wrap

If you complete all these exercises, you should end up with a lot of short animations that show your progress in developing a sense of timing. You should save these animations, both as a record of your progress and to show to peers, mentors and potential employers. One way to do this (without cluttering up your computer) is to create an archive reel, a videotape that contains all the exercises, tests and final animations you have worked on. This is different from your demo reel, which should only contain your best work; the archive reel contains everything, including mistakes. Having an archive reel is important when you start looking for work, too; employers will decide whether to interview you based on your demo reel, but they also want to see your archive reel to get a sense of the depth of your animation experience. If you don't main

CD-ROM

The animations, scenes and objects in this article can be found on the CD-ROM.

(Continued on page 37)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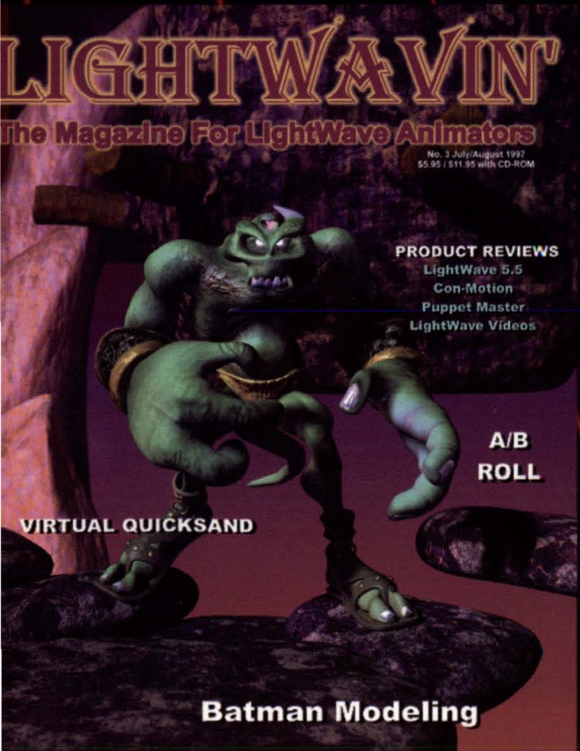
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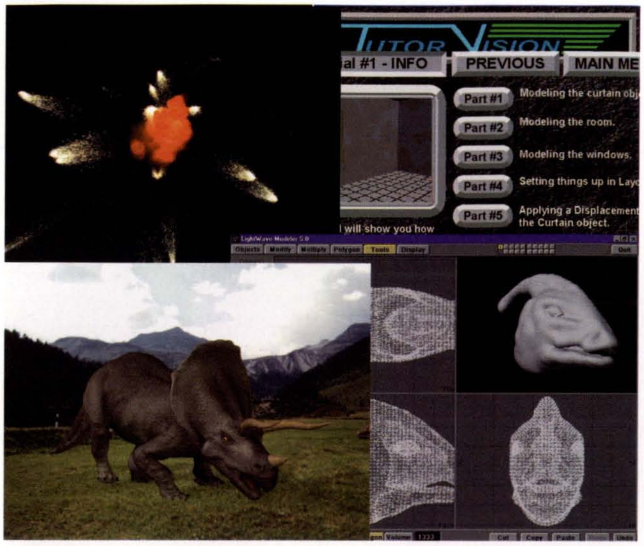


CD-ROM ROUND-UP

by Steve Bowie

ROM'in Other Worlds....

It's natural to draw comparisons between the pages of a book and the gigabytes of data concealed in a CD's iridescent spirals. Text, images and sounds (real-world or otherwise) combine to provide entry into other worlds... some fantastic and surreal, some utilitarian, others educational, yet others apocalyptic! We can not only tour these worlds, we can import them to our own virtual workspaces. Then we can recombine bits of these worlds, their imagery, sounds and ideas in our own creative processes and projects.

In this article, we're going to tour several different worlds in our continuing exploration of resources of interest to 'Wavers. Digital 'odds and sods,' spectacular pyrotechnics, LW tutorials, and lost worlds are all on the itinerary!

'I am become.... the Destroyer of Worlds!'

Dear to the hearts of many 'Wavers is something generally best toyed with virtually - the explosion! My own early efforts at pyrotechnics (at age ten) resulted in nearly burning down my accomplice's back porch. Now, however, thanks to LightWave and one or more readily available CDs full of blazing, cataclysmic imagery, the neighbors can sleep at night. Perusing any of the disks is an education in itself, providing insight into the kinds of fires and explosions appropriate to various needs.

In this genre, the name that will come immediately to most minds is Pyromania. Two volumes from Visual Concept Engineering bear that title, and have become industry standards. Their image sequences have been widely used in presentations on television and in other media. The primary content of both volumes is high quality sequences of Targa images at 640X480 resolution. The images, digitized at high resolution from 35 mm film, have been scaled down and are very clean. They range in length from less than a second to about five seconds. Preview animations in both AVI and FLI formats are a convenience, but may also prove instantly useful in projects requiring lesser resolutions. Included with each volume is a slim, printed manual which offers tips and a tutorial or two.

Pyromania Volume 1 offers three prime directories containing Firewipes, Fire, and Explosions. The 5 firewipes consist of flames traveling across the frame at various angles. The included alpha channel images for each allow the sequences to be used as transitions between video sequences.

Explosion sequences on Vol. 1 include small and large bursts, a lovely radiating shockwave effect, 2 different flak bursts, and three versions of the same 'Zero-G' explosion.

The Fire drawer holds five sequences, ranging from a simple candle flame through slow spread to more dynamic burns. A .wav directory holds 16 sound files in WAVE format suited to various sequences; and the Misc. drawer has a short 'filmburn' sequence. A number of example files are also provided to encourage your firebug tendencies.

Pyromania Volume 2 carries on in like manner, with a few differences. A voluminous, billowy firewipe complements three other additions to the Fire directory. A Fireworks directory has been added; it contains 3 different aerial bursts. Another useful new feature is the Smoke drawer, with sequences likely to prove useful in many a plane crash or military animation. Tutorials, WAVE files, and 2 Sparks sequences round out the offerings.

Blow Me Away...Again!

Blow Me Away...Again!

A new offering in the 'fire and brimstone' media class is the 2 volume set from Artsbeat Software - ReelExplosions1 and ReelFire1 provide a wide variety of glorious cataclysms. The format of the CD's I received is Apple's QuickTime (.mov) at fullframe 720X486 resolution. While this may serve some, it's a limitation for others. Specifically, to the best of my knowledge even the Mac version of LW is not yet QT friendly. Nonetheless, those with non-linear editing equipment may be able to avail themselves of the QT files. Others should consider the Targa sequence version also offered.

VCE
Movie Effects Studio
presents
PYROMANIA!
Playing With Fire

Though fairly pricey, these CD's nearly double the number available on the Pyromania disks, and provide a broad and lovely offering. The explosions are categorized as either Groundburst or Aerial, with aerial bursts further divided as Gravity Affected or Zero-G, Fullframe, or In-Frame. The range, color, and diversity of explosions is tantalizing. It's unlikely you'll be disappointed. Animations run between 1 and ten seconds, and thumbnail size versions are provided for convenience. The Extras directory adds some sounds in .au (Sun audio) format, several utilities, and Mattes in QT format for all the imagery. Several higher res versions as sequences of PICTs round out the package.

Similarly, ReelFire1 is a very nicely done disk! Nine Smoke animations are added to a gorgeous set of Fireworks, a variety of Flame QuickTimes covering the fullframe Inferno, rising Funnel Torch, Ceiling Fire, Propane Mortar, and more. Candle and torch (not the medieval kind) images are also on the disk. What makes this set particularly nice is the fact that nearly all of the animations loop seamlessly!

Either of these sets is bound to send you off into thermo-bliss. The REEL images are quite beautiful and well arranged. The Pyromania disks continue to provide high quality and a serviceable collection at a more affordable price.

Multimedia Grab Bag!

Silicone Cine, from the Land Down Under, has provided us with an interesting world to explore in its CD entitled Multimedia Ingredients, Vol. 1. Touring here is a rather psychedelic experience! The imagery offered is intended to supply, if not the primary building blocks of a multimedia presentation, then perhaps the mortar. The principle resource is 45 directories full of 640X480 jpeg sequences. They range in length from around 150 to 300 frames. Due to the rather small file size, some artifacting may be visible, but given their short duration and likely usage, this doesn't seem much of a problem.

It's rather difficult to categorize the sequences on this disk. They may be kaleidoscopic or more subtle images of colors in motion. The 'ambiance' can be underwater-ish, hallucinogenic, dreamy, or hypnotic. Here are a couple of descriptions from the enclosed folder: Journey through an underwater tunnel; Zooming in/out and rotating obscure animated kaleidoscopic texture; swirling/turbulent image wobbling in various directions.... get the idea? One animation is reminiscent of molten gold, another like a high speed journey into a rapidly rotating chrysanthemum. A few are morphing objects (don't ask me what sort of object - some sort of 'gon that would puzzle Ernie Wright!) against a blue sky backdrop.

Miniature QuickTime movies are provided, which may themselves be of use in some media. About two thirds of the animations loop nicely, though I suspect lengthy repetitions might lead to seizures or the wearing of tie-dyed tee-shirts. Don't imagine I'm belittling the disk though. The imagery, while not suitable to every need, certainly has a place on many desktops. 'Wavers could easily find uses for them as backdrops, or startling textures, and they lend themselves easily to use as elements for CD or live (Scala anyone?) presentations.

An added value on this CD is the Sound directory, which contains nearly ten minutes of stereo 16 bit WAVE files. The 'music' ranges from atmospheric through 'spacey' and 'creepy', with cuts running from about 10 seconds to a minute and a half in length. If your musical ability, like mine, is limited to drumming your fingers, this is a real plus.

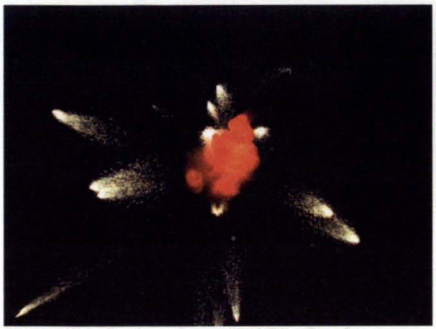
"Say, Is your Velociraptor House-broken?"

If 'MM Ingredients' turned your thoughts briefly back to the 60's, the DINOSAURS Collection, from Gruppo Iride in Italy, will send you running for your flint-tipped spears! Far removed from the realms of deep space so often frequented by 'Wavers, the antediluvian contents of this CD are nonetheless terrifically exciting! Why should Spielberg be the only one to cash in on the dino cachet?

This little silver disk is replete with the makings of a 'lost world' all your own. Not exclusively the terrain of 'Wavers, the collection contains files in the following formats: DXF, 3DS and Max (can I say that here?), Imagine (for Windows and Amiga), and VRML to boot! We'll dwell on the LW content of course.

And what lovely content it is! Not only are there ten nicely turned out dino objects, but each is already 'em-boned,' parented, 'nulled,' and ready

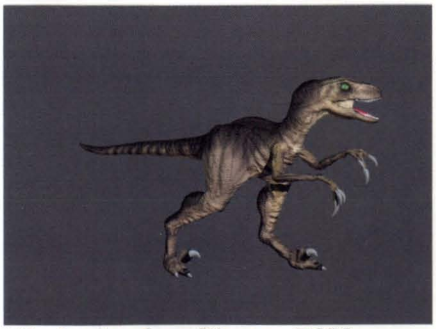
(Continued on page 38)



Hires Explosion from REEL Explosions1

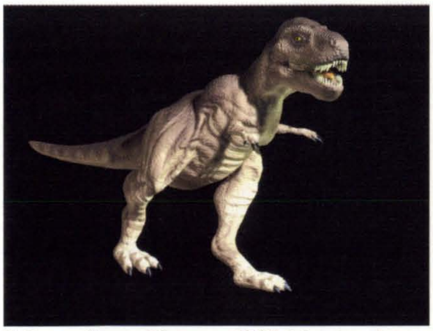
Frame from MultiMedia Ingredients sequence

Triceratops Render, from DinosaurROM



Velociraptor, from DinosaurROM

Rendered scene from DinosaurROM



T-Rexx, from DinosaurROM (note: above has black backgound, suitable for compositing)

for action. Making that action easier to create are the included scenes — a default and a walk (or swim, or fly) cycle scene for each. Merely scrutinizing the objects, scenes and textures is bound to be a valuable exercise for many. The mandatory T-Rex and Raptor are complemented by, among others, a nice predatory looking Pterodactyl, a shark, and a cleverly built mosquito ready to be imprisoned in amber. Preview anims are available for each critter in .mov, .flc, and .avi formats; and renders are supplied in a wide variety of image types including IFF, Jpeg, Tiff and Pict. Each object is nicely textured with supplied color and multiple bump maps as needed.

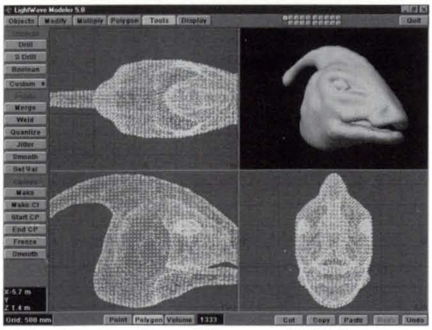
This collection is also nicely arranged for easy loading. Just point Layout's Content Directory to the DinosaursROM:Projects/Lightwv directory and select the Scene file you want. A set of tutorials in text and images invites the user to explore the construction of each object.

The objects are, shall we say, significant in size; and my poor machine bogs down badly when faced with 80,000 polygons or so. Thoughtfully, Gruppo Iride proves a 'low poly' version of each object, too, comprising roughly half the number of polys of the hi-res version. All in all, this CD is a joy to play with, and given the current dino-mania, may prove a good investment for you.

(NOT) Another Lost World...

VideoGems Vol.1 (from MegageM in California) is a bit of a side trip, even in as diverse a galactic tour as we're engaged on here. To longtime Waver's a peek into the tracks of this CD will be a trip down memory lane. To newer members of the LW fraternity (is there a gender-neutral term for this?) the distinctly Amiga'ish content may seem quite foreign, even obsolete. Still, the NewTek Video Toaster (LW's former hardware host) continues in wide use, as does the Amiga itself. The LW Scenes and objects are usable in any version of LW on any platform, and the imagery is supplied in a variety of formats, including BMP and GIF.

Those who do have a Toaster should be mighty pleased to see continued support. MegageM is responsible for a number of Amiga graphic utilities, and this parentage shows itself in the supplied files. FractalPro (not included) is a tool for generating colorful animations or single images. The VideoGems CD provides an even dozen ToasterCG fonts in three sizes mapped with FP generated images. I have a hard time getting worked up over them, but then I remember the 60's as more of a migraine than some. Also provided are around 60 new Switcher 'Blinds' effects and 'Wipes' (I'm not a *Toaster guy*, but anything that isn't a falling sheep has to be A Good Thing).



Velociraptor, from DinosaurROM

A diverse collection of fractal images, framestores, and renders is offered, some of which may be of interest as textures or backdrops. In some cases fractal images have been converted to LW terrain objects using MegageM's ScapeMaker utility (again, not included), and the original image can be draped over the resulting object for surreal animations. Now, I'm NOT greatly enamored of fractal images - show me three, I'm good for quite a while. Terrain objects textured with them remind me a little too much of the sort of stuff you'd see in an old Amiga magazine. If, on the other hand, you're addicted to them, well... to each his own!

Other objects converted with SM include a huge collection of real word DEM (landscape) files. The files are largely drawn from the Vista Pro collection, and have been 'downsampled' to allow loading into Layout. There are hundreds of these files, largely drawn from the familiar Grand Canyon, Hawaii, and Mars DEMs. The files in many cases are contiguous, but to use them contiguously you'll need to be familiar with VistaPro's numbering scheme, which is not explained in the documentation.

Install scripts purportedly ease the installation of requisite files for Toaster/Flyer owners, though I've not tried them out. This CD may be well worth the price to Toaster users in particular. That aside, unless you're a big fractal fan you may quickly tire of the imagery.

Tutorials Times Two.

Recently in these pages we've looked closely at a number of excellent LW tutorial videos. Two of the CD's under our scrutiny today bring us to the world of tutorial academia. The 'LightWave Expo New York' (LENY) and TutorVision 3-D CD take quite different routes, so we'll examine them less as competitors than as alternate approaches. TV3D is the CD equivalent of a magazine, with various features and tutorials. LENY on the other hand, is a nicely edited reprise of a presentation by the brothers Stranahan, Ken and Lee. The use of a CD provides certain enhancements (and limitations!) discussed below.

TV3D - Dave's World -

TutorVision is the pet project of the Internet 'LightWave Mailing List' moderator, Dave Warner. That in itself should move you to get your credit card out, but I digress...

TV3D presents the viewer with a 'dashboard,' from which you navigate the contents of the disk. The front end runs nicely under Windows (there is a 'fix' on the disk for NT users), and Dave has even gone the extra mile (maybe mile-and-a-half!) and endeavored to provide access to Amiga users. Amigans will have to sacrifice the convenient GUI, but, while I didn't spend a lot of time playing with this on my old 030/50 A1200, the tutorials did play at a reasonable rate (an 040 and AGA are recommended). Dave apologetically explains his travails in connection with the Ami version, and offers a money back guarantee. He should get a medal for even trying in my view.

Users of Windows machines can simply make their selection from the 'dashboard' and carry on. The main meat is of course the tutorial section. TV3D includes 6 tutorials. Selecting one brings up a 'sub-dash' with a window displaying a small .avi animation demonstrating the end product. The tutorials themselves are entirely 'screenshot and voice-over' style. The narration is easy to follow, and the onscreen action clearly visible. Included are lessons using 'pseudo-volumetric' fog in a logo, a 'wormhole,' a 'reveal' using effectors, an eclipse, blowing curtain, and the ever popular spaceblast! These lessons are not difficult and they underscore basic concepts; so they're well suited to newer 'Wavers (though intermediates will doubtless pick up a few pointers too).

Other resources available from the dashboard include a number of objects, scenes, and images - some are those used in the tutorials, others are companions to Alan Chan's excellent LW books. Speaking of Chan, another selection brings up a video interview with this gifted animator. Also on tap is the Animators Showcase, containing a wide variety of images from the LW Mailing List contests and work by other 'Wavers — the famous and the up-and-coming. In many instances, helpful text insights and web addresses accompany the renders. Also in the text are archives of the mailing list, along with selected tutorials.

TV3D contains a lot! There's more here than one can list. Other assets include demos of some popular utilities, and some useful textures. Dave's done a workmanlike job, and I'm glad this is only Volume 1. While some might note the inability to pause, 'rewind,' or 'fast-forward' the tutorials while viewing , the large screenshots and well thought-out workflow work in TV3D's favor.

Another Dynamic Duo - Ken and Lee.

As stated earlier, the LENY CD (actually, there are two) from Multimedia System Design of New York is a video reprise which takes full advantage of the CD medium. Presenting a distinctly 'LW 5.0-look' dashboard, the brothers Stranahan have put together a very convenient navigation system. Controls offered make it easy to avail oneself of the blessed non-linear nature of this medium - jump to and fro in the media, Fast Forward or pick a link from the ever-present index at the bottom of the screen to jump to another point.

The video portion of the CD is presented in a small window on the dashboard. This is my primary complaint - granted it takes substantial horsepower to deliver anything like fullframe video, but this merely points up the shortcomings of a CD versus a real video. The real McCoy may not be as convenient to traverse, but it's a darn sight easier on the eyes. The animation window on the 17" monitor I was using was about 2X3 inches. OK in brief bursts, but tiresome to these old eyes in longer stints, not to mention making it more difficult to make out finer details.

Speaking of animation, the entire presentation, indeed almost all of the CD, is comprised of QuickTime .mov files. The requisite software is provided if your PC is lacking in this department. However, there are no other files on the disk to speak of, no images, no scenes, no objects. The discussion and demonstrations are the thing, the ONLY thing.... just so you know.

Having mentioned that, I need also to point out that you'd have to go a long way to find a better LW raconteur than Lee Stranahan. Lee (well know in the past as a sort of Toaster Mohammed Ali, billing himself as the 'World's Smartest Toaster Guy') provides the verbal engine, while brother Ken, (renowned for his wonderful modeling as seen in the ill-fated Space Above and Beyond) strays not from the keyboard. Good use of zoom and cutaway goes some distance to overcoming the limits of the small playback window, and typically the discussion moves along at a brisk pace.

Topics covered in the Modeler segment include insights into metaform and metaballs, spline patching and more; Layout-related discussions include surfacing an allosaurus (more PhotoShop lessons!) and front projection mapping. The concepts are considered in a chatty Q&A style, with Ken 'accompanying' Lee at the keyboard in demonstration of the tools. The style reminded me of a casual university lecture - brisk, insightful, but not precisely linear - it would be a bit much to expect a newbie to keep pace as the conversation rambles a bit and occasionally leaps to an entirely different project.

'Guest spots' on the LENY CD's include a nice demo of Fiber Factory by P.J. Foley (adding a nice set of locks to a Rod Stewart caricature model), and Andy Frerking with a pretty thorough tour of Particle Storm (ever seen a tornado of cows?) Overall, the LENY CD is informative and interesting, well structured and makes nice use of the available tools. It's too brisk, even 'disconnected' in style for a LW beginner to attempt to keep up, but others should really enjoy it's discursive and informative approach. If I sound a little less than enthusiastic, it's not that I didn't enjoy LENY. It's just a little different and hard to categorize, and I personally would have liked it better presented simply as a video that I could watch full screen in my living room, beverage in hand - less whizbang maybe, but a lot easier (or maybe more comfortable) to view.

Wrapping Up -

Well, we've been a lot of places in our tour - Tutorials to Toaster-land, molten gold to mosquito, sound, fury and maelstrom! The intrepid 'Waver's quest continues, and these CDs and others provide resources beyond recounting. We'd love to hear of your own favorite CD worlds - feel free to e-mail the author at lightwrx@interlog.co

Companies Mentioned

Event Horizon Studios
Tutorvision 3DCD $49.95
518-756-6850

VCE
Pyromania I & II $199.95 ea.
818-367-9187

MSD
Leny CD-ROM $79.95
212-979-2310

DB-Line
Dinosaurs Rom $149.95
(Italy) 0332-749000

MegageM
VideoGems $99.00
805-349-1104

ArtBeats
ReelFire & ReelExplo. $499.95 ea.
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Siliconcine
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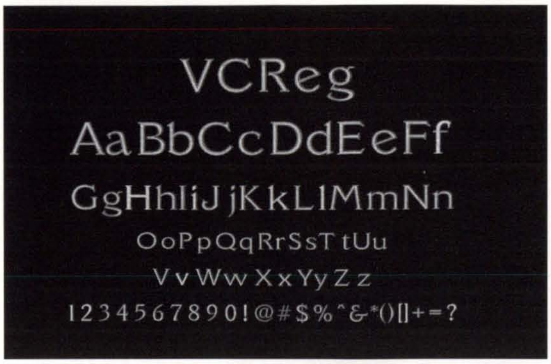
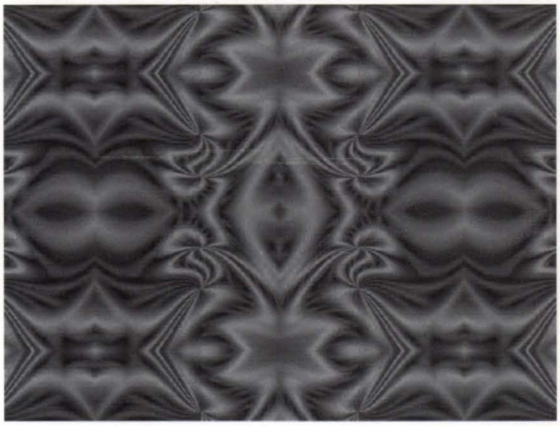
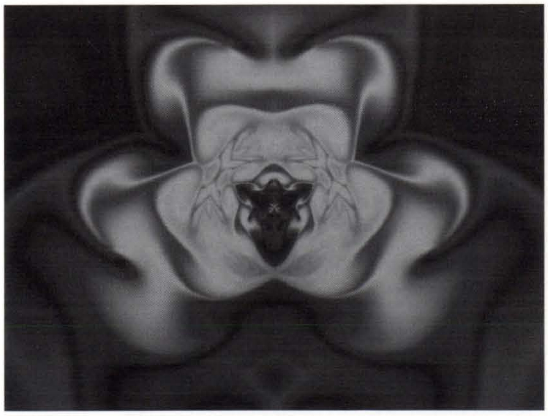


ToasterCG font from MegageM's Video Gems CD

Render of DEM object from Video Gems Hawaii



Frame from MultiMedia Ingredients sequence



Frame from MultiMedia Ingredients sequence

SMOKE FIRE and EXPLOSIONS !!

By Daniel Maas

One of LightWave 5.5's coolest new features is 'Steamer,' a plug-in by Gregory Duquesne. Steamer allows (finally!) the creation of true volumetric lights, particles, and fog. This extremely powerful tool can seem quite daunting. Attention to detail is required to produce good results. There really is no substitute for experience. That said, here are some tips for both new and advanced users of 'steamer.'

This article focuses on the combined use of volumetric objects and 'Particle Storm' to produce pyrotechnics. The fundamental concepts, however, apply to all Steamer effects. Particle Storm Pro is helpful for some of the more advanced techniques, but a basic familiarity with PS Lite will suffice. Also, please note that extensive documentation is already available on your LightWave 5.5 CD.

The Basics -

Here are a few suggestions to get you started:

Steamer's parameters are very different from standard LightWave surfaces. 'Luminosity' is like the "Diffuse" setting, controlling overall brightness or reflectivity. 'Opacity' is simply the opposite of transparency. 'Attenuation' controls the rate of light dissipation as it traverses the 'steam.' High luminosity, low opacity, and low attenuation mimic bright fog or mist. Low luminosity, with high opacity and attenuation create dark, thick smoke.

You must designate a light source to see Steamer effects. Shadowing is optional. If you don't need shadows to appear on the steam itself a simple distant light is fine. Otherwise, use a spotlight with a large shadow map size (over 1000).

Use particles sparingly. Most effects require less than a thousand to be convincing. Steamer can safely handle approximately 100 particles per megabyte of free RAM (when coupled with Particle Storm). Particle systems that number in the thousands will almost certainly consume too much RAM and cause a crash. It helps to think of the particles as locating where the effect will appear on-screen, rather than shaping its details. An even spread of about one particle per ten or twenty screen pixels works well.

Automatic Sizing is helpful to produce an effect quickly. Be aware that the steam will cover a much larger area than the particles might indicate. Too, auto-sizing is very sensitive to the locations of individual particles. Sometimes one wayward point can create a huge blob, ruining your entire effect! It is generally desirable to keep particles in a tight group.

Steamer's 'Fractal Noise' options also differ from their surface texture counterparts. Generally, the 'Small Scale' value should be minuscule (less than one tenth of the particles' total spread). You may have to increase contrast or amplitude to see any change. Don't push them too far or you may encounter ugly banding patterns and holes.

'Steamy_Particles' is useful for changing the look of the steam relative to points in space. First, obtain settings for the effect near its designated object. Use "get normal values" to copy these settings to Steamy_Particles. Then experiment with the parameters for particles far from the designated object. Note that this approach is the opposite of the way surface textures work.

If particles will be 'dying' (or 'recycled') during your animation, make sure that they fade out in some way before they disappear. Use Steamy_Particles to modulate luminosity and opacity down to zero, or use an active light that falls off to zero.

Animate your entire scene before adding Steamer or Particle Storm effects. It is both arduous and irritating to redo the whole particle system if you need to change the timing or object locations.

Steamer should NOT take forever to render! On a midrange Pentium, most effects will add somewhere between one and thirty minutes per frame to your rendering time. Penalties exceeding thirty minutes indicate that you probably need to rethink your approach. Remember, the fewer the particles the better. Turn off shadows, and reduce sampling to speed up the render.

Advanced Techniques -

Several of these examples require parenting a fountain emitter to a moving object, not possible using Particle Storm Lite. You CAN use these effects on a stationary object, but I highly recommend upgrading to PS Pro if you're serious about getting the most from Steamer.

Smoke Trails -

An air-to-air missile flies across the frame, leaving behind a faint exhaust plume... The camera tracks a rocket as it lifts-off atop a dense column of smoke...

First, create the animation of the missile or rocket. Parent a null to the projectile, just where the smoke should emerge. Parent Particle Storm's fountain emitter to the null. Use only about 200 particles. This will be sufficient even if the missile is visible for as long as five seconds. Emission velocity should be low. You want the particles to exit the missile, then gently float around. Give them enough speed to spread out a little bit and add some wind. Don't worry about the 'Shader'... you won't use it.

If the rocket shoots past a stationary camera, don't let the particles die. Set 'Deathwish' beyond the end of your animation. Turn off 'recycle particles.' Divide the number of particles by the time the missile is onscreen to arrive at the emission rate (I generally aim for 10-50 particles/sec).

If the camera follows the missile, you only need sufficient particles to get to the edge of the frame. Set Deathwish low, and turn recycling on. Try to put all 200 particles in the image for the entire duration. Make sure to turn oversampling on if the particles emerge in visible bursts.

Record the animation and load up the Particle Storm object file. Then activate the displacement plug-in, and enable Steamy_Particles. Add a white distant light and make it dedicated (specular and diffuse off). Now enter Steamer, and activate the object (using your new dedicated light). Automatic sizing should be on, threshold 2. Use medium luminosity (around 20) to create bright smoke. Opacity should be higher, like 80. Use only a small amount of attenuation. Add some fractal noise if the effect is too 'blobby.' Don't overdo it and make big black clouds if you want to maintain realism. If you get big 'doughy' cotton balls, make sure the particles stay close to each other. Cautiously increase the number of particles until the effect is convincing.

For fiery exhaust, use a semi-transparent ellipsoid with moving fractal noise. Add a lens flare. Trying to do this with Steamer would be a waste of rendering time.

Burning Wreckage -

Pieces of debris shoot out of the fireball; they leave a glowing trail that gradually fades as gravity pulls them downward...

SMOKE TRAILS - Notice the subtle yet realistic exhaust trail of the missile.

OILY SMOKE - Opaque black clouds emerge from the doomed helicopter

First, we need the basic path of the wreckage. You can use Particle Storm on a group of say, five particles, to create five ballistic motions (or you could keyframe it by hand). We need to end up with a number of null objects on projectile trajectories.

Load Particle Storm. Parent a fountain emitter to each null. The particle groups should have about 200 particles, with deathwish and recycling both off. These particles will become the volumetric particles that define the trail. Emit the particles at low velocity, and add some gentle downward drifting. Don't spread the particles too far apart!

Back in Layout, we need to make dedicated light sources for Steamer. Load up the particle objects, and add both Particle Storm and Steamy_Particles displacement plug-ins. Each group of trail particles needs a white point light, parented to the null that leads it. Turn off diffuse and specular. Define the light's falloff so that at any one time it covers maybe half of the entire trail. The result is a light source that strongly illuminates the smoke at its tip, and falls off to nothing down the path. Clone this light, and parent each clone to a single trail.

Now we're ready to set up Steamer. Activate the particle objects and designate their respective dedi-

(Continued on page 42)

(Character Shop - Continued from page 29)

tain an archive reel, it can hurt you later on.

One of the biggest stumbling blocks to producing your first animation reel is getting your rendered animations onto the VHS videotape that most studios prefer. Disk recorders, single-frame VTRs or scan converters are either too expensive for a beginner or produce poor quality video. Recent developments in video cards have changed that: with a little effort and a very small amount of money, you can put all your animations onto videotape from your own PC. The results of this process aren't anywhere near broadcast quality, but they're good enough to display your character animation skills.

I've written this tutorial for PC-compatibles running Windows 95. The software used are mostly DOS command-line utilities, but they all work within Win95's MS-DOS window. Similar solutions do exist for other LightWave-compatible platforms and operating systems, so you can use this tutorial as a guide to finding a solution that fits your system. I have deliberately limited this tutorial to free- or shareware programs, with the exception of the drivers and utilities bundled with ATI video boards. My experience has been with the ATI Pro Turbo PC2TV, but other ATI video cards with MPEG acceleration should be able to give you similar playback rates. I paid just under US$250 for the Pro Turbo when it first shipped, but I've seen prices as low as US$150 for other ATI boards. They aren't limited to TV output, either; this series is a pretty nice video board overall, and I recommend them if the specs suit your needs. For details, check out http://www.atitech.com. I haven't tested boards from other manufacturers, but any board that accelerates MPEG playback and provides NTSC video output may give you acceptable results.

The basic process is to render and edit your animation to produce a series of still images, convert those images to a format compatible with an MPEG encoder, encode the images into an MPEG video stream, encode the sound into an MPEG audio stream, multiplex the MPEG video and audio streams together, and play the finished MPEG movie through the ATI board to produce 30 fps NTSC video to your VHS VCR.

Step 1: Render images.

Render a sequence of TGA images to 352x240 resolution, 24-bit color depth, at 30 fps for best NTSC video recording through the ATI output. Render the files to the path C:\RENDER\TEST0000.TGA, if you want them to be compatible with the example commands in this tutorial. I like to keep all the current project files in the RENDER directory to avoid confusion. At several points in this process, you will nearly double the hard disk space required to store working files. Make sure you have plenty of room! 352x240 may seem like low resolution, but it's not actually much lower than a typical consumer VHS deck can reproduce, and is adequate for showing your timing and poses. When you're a working professional, you can afford broadcast-quality video transfers; if you're a beginner, I'm sure you have more pressing demands for your cash!

It's a good idea to append at least 30 frames of color bars, then another 30 frames of black at the beginning of the first video sequence. You can either append these during editing, or render them at the beginning of the image sequence. If you plan to append other sequences on videotape, you should also end each rendered sequence with 30 frames of black. This will give you a little more slack in matching your assemble edits, especially if you are using a consumer-grade VCR that doesn't make clean edits.

Since some pixel-size detail is lost in the MPEG compression, it's a waste of rendering time to use too much antialiasing. Motion Blur or Soft Filter is a good idea, as it helps smooth over the occasional dropped frame. Turn on NTSC color saturation limits or rendered colors may oversaturate the video output and create glaring artifacts on your videotape.

Step 2: Edit and assemble images and soundtrack.

If you rendered the TGA sequence just as you want it on videotape, you can skip ahead to step 5. Otherwise, load the image sequences, AVI clips, WAV files, etc., into a new project in your editing software. This tutorial uses Adobe Premiere, but you can do most of this with shareware programs, too. You can save effort by setting up a default project for producing MPEGs, with the following parameters:

No compression

TGA numbered sequence output (TEST0000.TGA)

30 fps output 352x240 output resolution

C:\RENDER output path

very low-resolution AVI Preview with full audio

Edit the source files together to get the final effect you want on the videotape. Make a thumbnail AVI Preview to check the sound sync, video f/x and transitions. 160x120, one of Premiere's presets, is usually adequate and will give 30 fps playback on any MPC2-compatible computer.

Step 3: Output edited images as continuous TGA numbered sequence.

When the project is edited to your satisfaction, save it with a new filename. Output the video as a 24-bit 352x240 TGA image sequence to path C:\RENDER\TEST0000.TGA.

Step 4: Output synchronized sound and convert it to an audio MPEG stream.

If the project has a soundtrack, you will need to output the sound as a single WAV file, synchronized at 30 fps, at the audio quality you want on the videotape, to path C:\RENDER\SOUNDTRK.WAV. In Premiere, you can do this by opening the thumbnail AVI Preview as a Clip, and use the File|Export|Waveform menu option to create the WAV file.

Once you have the WAV file, you need to convert it to MPEG. Cool Edit is a shareware sound editor with a plug-in to encode MPEG audio streams. You can download a trial version and the MPEG plug-in from http://www.syntrillium.com/cool.htm. Load the WAV file in Cool Edit (make sure you have the MPEG encoder plug-in installed), and use File|Save As to convert it to C:\RENDER\TEST.MP2. Make sure the bitrate, mode, and sampling rate are compatible with your machine's playback capabilities.

To test your machine's playback rates, you can try loading sample MPEGs and watching (and listening) carefully for dropped frames or slow playback. Media Player or the ATI Player will both give you information about an MPEG's audio and video streams, including the actual playback rate. As an example, the audio stream for the "Balls & Blocks" MPEG on the ATI CD-ROM is Layer 2, 224 Kbps, 44.1 KHz 8-bit Mono, and it played back without a hitch on my system.

Step 5: Use DISPLAY.EXE to convert TGA sequence to YUV format.

The MPEG video encoder requires YUV images for input. You can use the freeware program DISPLAY, written by Jih-Shin Ho, to quickly and easily batch-translate the TGA files to YUV format. You can download DISPLAY from the author's site at http://bicmos.ee.nctu.edu.tw/Display/, or from a software repository at either http://www.simtel.net/simtel.net/msdos/graphics-pre.html or http://oak.oakland.edu/simtel.net/msdos/graphics-pre.html. Look for files disp189a.zip and disp189b.zip.

The basic syntax for using DISPLAY.EXE, excerpted from the DISPLAY.DOC file included with the software, is listed in Reference A (pg 39).

For this project, the command line:

```
display -byuv —same -w352 -h240
c:\render\test*.tga c:\render
```

produces a .YUV file sequence in path C:\RENDER, with the same color depth, 352x240 resolution, from the original Targa images in the path C:\RENDER with filename root TEST. This is suitable for a .YUV sequence to compress into an MPEG-1 stream using MPEG2ENC.EXE. This conversion only takes about 2 seconds per image, but long sequences add up. On a 133 MHz Pentium, it can take 90 minutes to convert the 1800 frames necessary for one minute of NTSC video. It's like an extension of the rendering process; be patient, and make sure you have plenty of disk space.

Retyping the command line is tedious and error-prone; you can save time by always rendering your image sequences as C:\RENDER\TEST0000.TGA, and making a DOS batch file to execute the command line.

When the YUV translation is complete, move the original TGA files to another drive for storage or back them up and delete them. If the next step goes wrong, you may need them again, but if you're making a long MPEG you will probably need the storage space the TGA files are occupying.

Step 6: Use MPEG2ENC.EXE to compress YUV sequence to MPEG-1 stream.

MPEG2ENC.EXE is a free MPEG video encoder released by the MPEG Software Simulation Group. You can download an archive including the encoder and decoder executables, plus the source code, from http://www.creative.net/~tristan/MPEG/mssg/mpeg2v12.zip. MPEG2ENC.EXE requires command line instructions and a fairly complex parameter file. Several sample parameter files are included with the software archive, along with documentation that describes the function and options for each parameter. I've experimented with these files a bit, and found some parameters that work well with the ATI boards. For this project, the parameter file will look something like this: (See Reference B -pg 39&40)

The important variables for this project are:

line 2, set for TEST0000 filename root

line 7, set for YUV format

line 8, set for 412 frames in the YUV image sequence. You will have to change this value to the frame count of each animation, but most of the other values should stay the same once you find the settings that work for your system.

line 9, set for the first frame of the YUV image sequence, TEST0001.YUV

line 13, set to encode an MPEG-1 file; 0 produces an MPEG-2 file

line 15, set for the horizontal resolution of the incoming images, 352

line 16, set for the vertical resolution of the incoming images, 240

line 17, set for normal 1:1 aspect ratio. This is the aspect ratio of the incoming images, and should match the original rendered aspect ratio.

line 19, set for the bit rate your computer can sustain. For example, ANIM1.MPG from the ATI CD-ROM has a bitrate of 1125000 bps, and plays back smoothly. Your machine's performance may vary; if the playback stutters, try reducing this number.

line 20, set for the default MPEG-1 buffer size of 20.

line 31, set for the horizontal resolution of the output MPEG file, 352.

line 32, set for the vertical resolution of the output MPEG file, 240.

If you really love getting technical, you can read the docs included with the encoder, plus the background materials available at http://www.mpeg.org, and tweak all the parameters to suit yourself. The command line will be easier to type if you keep a copy of the parameters file in the same directory as the project files, in this case C:\RENDER. For this project, the command line reads:

```
mpeg2enc mpegtest.par test.mpg
```

which produces a 412-frame, 352x240 resolution, 24-bit color MPEG-1 file, C:\RENDER\TEST.MPG. This will take a while, usually several seconds per frame on a P133. Again, this is like an extension of the animation rendering process. Make sure you have adequate hard disk space, start the process, then go do whatever you usually do during a long render.

Step 7: Use MPLEX.EXE to multiplex the MPEG video and audio streams.

MPEG1 Systems Multiplexer, MPLEX.EXE, is a freeware utility written by Christopher Moar that combines video and audio MPEG streams. To download it, link to http://www.visiblelight.com/mpeg/software/windows.htp or download directly from http://www.powerweb.de/mpeg/util/msdos/mplex11.zip or http://www.powerweb.de/mpeg/msdos.html. Install it somewhere in your default path, I chose to put it in the C:\RENDER directory with the rest of the MPEG stuff. The command-line controls are relatively simple:

```
MPLEX <input stream> [<input stream2>]
<output system stream>
```

So the command for this example is:

```
mplex test.mpg test.mp2 testsnd.mpg
```

to produce a synchronized-sound MPEG-1 stream, C:\RENDER\TESTSND.MPG.

Step 8: Test the new MPEG file's playback.

Hook up your VCR to your ATI board's video output. Hook up a TV or monitor to the VCR's output, so you can preview what will be going onto the tape. Use the ATI Desktop controls to adjust the video output position and size to completely fill your TV monitor. It's OK if the TV bezel cuts off a little bit of the image's margin on each side, but you don't want a distracting black border around your animation. Launch and set up Media Player (with the ATI MPEG driver) or the ATI Player for full-screen playback to videotape. If you use the ATI Player, press F2 to hide the Player controls during full-frame playback.

If the MPEG file works, rename it and make a backup copy, so you won't accidentally overwrite it with your next MPEG. If your MPEG files won't play back at 30 fps, try re-encoding them with a lower bit rate by changing line 19 in the parameters file. The lower the bit rate, the lower the image quality, but you have to work within your system's limits. With the MPEG acceleration of the ATI board, I've been able to get some pretty good-looking videotape. You can't expect a client to pay you for the VHS-quality playback you'll get from this process, but it's good enough to build your animation demo reel. The most important factor is getting an accurate, consistent frame rate so the reviewer can assess your timing. The slightly smeared edges and color artifacting of MPEG-1 compression isn't going to harm your work, at least as far as most animation studios are concerned. ■

REFERENCE A

```
(c) For command-line batch conversion :
display –batch | -b <output_format> [–bw|–grey|–color|–true|–same]
[–stay] [–dialog | -g] [–report|-r <report_file>] [–effect]
[–width|-w <image_width>] [–height|-h <image_height>]
[–skip <bytes>] [-i]
input_file | input_file output_directory | input_file output_file |
input_files output_directory
output_format: Standard extensions. Like gif, bmp ... (see section (6))
bw,grey,color,true: B/W dither, Grey scale, 8bit full color,
24bit true color.
same: The same color format as input image. If input is 24-bit image,
output is saved as true color image (if possible). Otherwise output
is saved as 8bit full color image.
The default color type for batch conversion is 8bit full color.
-g: DISPLAY will let you change the setting of output_format if there
is any.
+ –stay: Don’t exit DISPLAY after viewing.
+ –effect: Perform default special effects (in config.dis) on images.
+ –skip: Number of bytes to skip before reading .GRY and .RGB images.
+ -w & -h: For images format without information header(YUV,RGB,GREY).
+ -i : Don’t initialize screen.
```

REFERENCE B

file MPEGTEST.PAR:

```
MPEG-1 Test Sequence, 30 frames/sec, for ATI PC2TV playback
test%04d /* name of source files, i.e., TEST0000 */
- /* name of reconstructed images (“-”: don’t store) */
- /* name of intra quant matrix file (“-”: default matrix) */
- /* name of non intra quant matrix file (“-”: default matrix) */
stats.doc /* name of statistics file (“-”: stdout ) */
1 /* input picture file format: 0=*.Y,*.U,*.V, 1=*.yuv, 2=*.ppm */
412 /* number of frames */
1 /* number of first frame */
00:00:00:00 /* timecode of first frame */
15 /* N (# of frames in GOP) */
3 /* M (I/P frame distance) */
1 /* ISO/IEC 11172-2 stream */
0 /* 0:frame pictures, 1:field pictures */
352 /* horizontal_size */
240 /* vertical_size */
1 /* aspect_ratio_information 1=square pel, 2=4:3, 3=16:9, 4=2.11:1 */
5 /* frame_rate_code 1=23.976, 2=24, 3=25, 4=29.97, 5=30 frames/sec. */
1125000.0 /* bit_rate (bits/s) */
20 /* vbv_buffer_size (in multiples of 16 kbit) */
0 /* low_delay */
1 /* constrained_parameters_flag */
4 /* Profile ID: Simple = 5, Main = 4, SNR = 3, Spatial = 2, High = 1 */
10 /* Level ID: Low = 10, Main = 8, High 1440 = 6, High = 4 */
1 /* progressive_sequence */
1 /* chroma_format: 1=4:2:0, 2=4:2:2, 3=4:4:4 */
2 /* video_format: 0=comp., 1=PAL, 2=NTSC, 3=SECAM, 4=MAC, 5=unspec. */
5 /* color_primaries */
5 /* transfer_characteristics */
4 /* matrix_coefficients */
352 /* display_horizontal_size */
240 /* display_vertical_size */
0 /* intra_dc_precision (0: 8 bit, 1: 9 bit, 2: 10 bit, 3: 11 bit */
1 /* top_field_first */
0 0 0 /* frame_pred_frame_dct (I P B) */
0 0 0 /* concealment_motion_vectors (I P B) */
```

REFERENCE B - continued from previous page

```
1 1 1 /* q_scale_type (I P B) */
0 0 0 /* intra_vlc_format (I P B)*/
0 0 0 /* alternate_scan (I P B) */
0 /* repeat_first_field */
1 /* progressive_frame */
0 /* P distance between complete intra slice refresh */
0 /* rate control: r (reaction parameter) */
0 /* rate control: avg_act (initial average activity) */
0 /* rate control: Xi (initial I frame global complexity measure) */
0 /* rate control: Xp (initial P frame global complexity measure) */
0 /* rate control: Xb (initial B frame global complexity measure) */
0 /* rate control: d0i (initial I frame virtual buffer fullness) */
0 /* rate control: d0p (initial P frame virtual buffer fullness) */
0 /* rate control: d0b (initial B frame virtual buffer fullness) */
2 2 11 11 /* P: forw_hor_f_code forw_vert_f_code search_width/height */
1 1 3 3 /* B1: forw_hor_f_code forw_vert_f_code search_width/height */
1 1 7 7 /* B1: back_hor_f_code back_vert_f_code search_width/height */
1 1 7 7 /* B2: forw_hor_f_code forw_vert_f_code search_width/height */
1 1 3 3 /* B2: back_hor_f_code back_vert_f_code search_width/height */
```

(Getting Down To Business - Continued from page 9)

Barber College! "Damn it Jim! I'm not a businessman, I'm an animator!" Sorry Bones, but you are.

WHAT HAVE WE LEARNED?

If you're asking yourself this question, you need to start at the beginning of this article again. You are a businessman. You sell value and opportunity. You provide value and opportunity in the form of your work. Money is a direct result of providing value and service. Most sane people know that everything they want costs money. Most are prepared for that. All they want is to feel they are getting what they pay for and perhaps a little more. It is your job to see that they get it. This way of thinking will pave the way for future jobs. There is no better advertising than having a satisfied customer brag about you. One person's speaking well of you is better than anything you could ever say about yourself!

START HERE

Here is a list of some markets you may want to consider:

Churches and religious organizations
Cable companies
Television stations
Hospitals
Corporations
Ad agencies
Post production companies
Cable access channels
Chamber of commerce
City and state governments
Game developers
Web page developers
Businesses on the Internet
Television shows

Marketing is hard work if you want to be successful. Some have argued that my tips on marketing are based mostly on cold calling; and that I should also mention joining organizations, becoming a member of a group, or networking. Here is my reply. I'm sure that it wouldn't hurt but why would you want to network with others who won't buy what you have to offer? Most of these groups comprise people just like you, people who want work. Now I'm sure some of these people might be able to use you on a project they're working on, but that rarely happens. Your time would be better spent going after the people who will give you a job. Nothing works better than going out and asking for one.

Don't restrict your marketing efforts to just your local area. This is a big planet! Sending letters and sample images of your work by way of mail or the Internet is a great way to market yourself. You can contact the FCC to get a list of every television station in the United States. They each have someone doing their graphics. It might just be me! I dare you to try and take the business away from me! Happy hunting!

THE FUTURE

The area of business is a large one to cover but I am up to the challenge! It's just another way for me to create opportunity! Some of you will be happy to hear that I will have follow-up tapes to "Starting Your Own Animation Business" in the very near future. The series will cover what I consider the most important areas of your animation business. You'll be able to choose only the areas in which you feel you need help. Some will also be happy to hear that the production values of these tapes are pretty much in your face with plenty of visuals. The tapes are very in-depth and they give examples of markets to hit and how to hit them, demo tape samples, letters to write, and contracts. They even have examples of what exactly to say when you are pitching your services, how to follow up, and how to select and use the right tools. There is a section on resources — who to call or write to get grants through city, state and federal agencies. The list goes on and on.

As I'm sure you're aware, this topic is a real monster; but many have slain the dragon and I'm sure your name will one day be on the list! I have finished production and will go to post soon, but I wanted to get your feedback to be sure I have covered the major concerns. If you have something you would like to see, send me an e-mail. I can be reached at ianim8@airmail.net.

IN CLOSING

I've been out of the loop for a while, being in Hawaii so long. Darn. Oh well, a man has to do what a man has to do. It is my understanding that Dan Ablan got hitched a short time ago so I would like to send my congratulations. If he hurries and has a few kids, they can help him run AGA!

I look forward to next time when I will cover, "How to Make the Transition from Animation to Barber College!" (Just kidding!) Thanks to all!

Tom Rennen is the owner of Intelligent Light and the producer of the 'Starting Your Own Animation Business' video. He can be reached via e-mail at: ianim8@airmail.net.

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(Smoke, Fire & Explosions - continued from page 36)

cated lights. Make the color an orange-yellow shade. Luminosity should be high (around 80, to control the brightest part of the flame). Set opacity lower, but above zero (around 2-5). This affects the end of the smoke trail. Add some fractal noise - Boom! There you go!

* Don't worry if nothing shows up in the preview - a known bug prevents Steamer from accessing the light sources.

Flying Debris

The missile detonates, and pieces of charred shrapnel fly from the crippled helicopter...

Note: This effect requires an updated version of Particle Storm Pro. Get the patch at ftp://ftp.dynamic-realities.com/pstorm.

In Modeler, make about five different suitable pieces of debris. They could be boxes, tubes, whatever. Just make them look like they were once part of the main object. Create a null object, and place it at the origin of the explosion. Go into Particle Storm, and parent the fountain emitter to the null.

Decide how many pieces of debris you want. I suggest using between 20 and 100. This becomes the number of particles in your particle group. Turn recycling off. Set the project's 'start frame' to have debris emerge at the right time in your animation. Crank the emission rate way up (so that all the particles are blown out in a few frames). Play with gravity, wind, and collision detection to your heart's content. Record the animation.

Now make a new, temporary scene. Load up your debris objects. You must give each one a single keyframe in a very out-of-the-way place (the objects will default to this position when they are not active as particles). Now clone each one several times, so that you end up with the number you chose earlier. Use the 'PostProcess' plug-in to assign particle motions to the objects (refer to your manual).

Use "Load from Scene" to bring in the debris object from the temporary scene. I recommend you do this step after the animation is complete, as your object list will get quite crowded!

Explosions -

BOOM! A gigantic orange fireball engulfs the terrain, rising and billowing into a cloud of oily smoke...

Blowing something up? Steamer and Particle Storm are the perfect solution to your pyrotechnic needs. Step one is to animate the scene. Saw your 'victim object' into big pieces and move them apart. Get a good camera move (hint- parent it to a null). Add some shake. Now we're ready for some 'pyro!'

BURNING WRECKAGE - Fingers of flame and smoke shoot from the explosion

FIRE - All of the fiery gas and trails are Steamer effects applied to particle systems

Add a null object wherever you want some dark, oily smoke to appear. In Particle Storm, parent an emitter to each null. Use about 100-500 particles for each smoke group. Don't let the particles die! Turn off deathwish and recycling.

If the nulls remain stationary the smoke should be emitted upward with enough velocity to form a nice pillar. If the smoke emitters fly around, emission speed should be close to zero. Add a little wind pointing up. Remember, keep the particles in a tight group. Visualize how big the smoke should be, and try to fill that volume on screen. Don't worry if the particle density appears low. Record the system.

Add a dedicated light source. Unless you need volumetric shadows, a simple white distant light is sufficient. Now load up the particle objects, and activate the two appropriate plug-ins. Go into Steamer and activate the objects using your dedicated light.

We want inky black smoke coming from the emitters, which then turns slowly lighter and more transparent. First, we'll set the parameters for the smoke just as it exits the emitter. Use low luminosity (0-15) and high opacity (80-100). Set the color to off-white, to match your lighting (pure black particles are unrealistic). Use as much fractal noise as you can without causing obvious banding. Most important is the size setting. Set it so that the particles have substantial overlap near the emitter.

Now we'll finish the smoke. Activate the "distance" parameter in Steamy_Particles and set the relevant object to be the emitting null. Choose your min-max range so that the transition will occur across the whole frame. Now click "get normal settings," and start playing with them. I turn luminosity down to 0-5 and opacity down to 0-30. Give the smoke a slight tinge of color. In my case, sky blue looked best. Also, enlarge the fractal noise scale.

You have a number of choices to create the fire: a simple lens flare, a captured pyro element, or a Steamer effect. I must warn you that realistic fire is one of the most difficult things to simulate with Steamer. Often an image sequence looks better and takes far less time to render. If you are using images, be sure to read the next section for a big caveat.

For Steamer fire, you need to start with a complex particle system. The basic idea is to have a large number of particles that overlap significantly. An individual particle won't be very bright, but the cumulative effect of all the particles will be quite good-looking.

Emit the particles from your explosion null object, and add drag and gravity (so that they slow down and drift). The particles (around 1000-5000) should be allowed to die, because they will be out of range of the active light before they disappear. It's a good idea to use multiple particle groups with different parameters for a varied effect.

Bring the recorded particles into Layout and add a yellow-white point light. This designated light should fall off to zero just before the radius where particles begin to die (i.e., if the first particle to die disappears 3.0m from the emitting null, set your falloff to 2.8m).

Activate your particle object, and select the designated light. Set the size so that the particles overlap a great deal. Lower luminosity to less than 2% so the effect loses its 'overexposed' look. Falloff should be 2 or 3 - set it so that you can't see individual particle dots. Opacity and attenuation should be zero. Experiment with small fractal noise scales. The result is an orange-red fountain of fire that rises and dissipates with altitude.

Steam Engines -

Be aware that effects using this technique are resource hogs - 128MB of RAM and four days on an Alpha in my case. The next version of Steamer is expected to be able to read Particle Storm data, making realistic fire effects much easier to achieve.

The Z-Buffer Limitation and Compositing -

Steamer determines whether an object is in front of your particles by using a Z-Buffer, which stores the distance to the nearest surface for each pixel. Unfortunately, there is no way to account for transparent objects; to Steamer they are just as opaque as a brick wall. This presents a problem if you plan to use transparent polygons for pyrotechnics (à la VCE's Pyromania). Steamer will not render anything behind them. You must first render the scene without any transparent objects, then composite.

To make matters worse, Steamer currently does not output alpha channel information. You have two choices: render the transparent objects on top using the 'Steamed' frames as a background sequence, or - render the Steamer effect on its own, and composite in 2-D. I recommend the latter, as it offers more control over each of the layers. Adobe After Effects, or Eyeon Software's Digital Fusion are perfect for this task.

Common Problems and Solutions

Steamer can be unpredictable. It's a relatively new plug-in, and has more than a few bugs. Here are some solutions to common problems that occur when using Steamer:

I turned off Automatic Sizing and now my entire image is saturated with the effect!

Particle Storm puts dead particles right behind the camera so they won't render. Unfortunately, Steamer detects these unwanted points and renders a huge blob covering the entire image. The only workaround is to enable automatic sizing, or downgrade to a previous version of psplay.p with "dead area" controls.

Nothing shows up!

Did you remember to designate a light source? Are shadows hiding your effect? Make sure that "Use ParticleStorm Data" is unchecked (a bug causes this feature to hide your particles).

There are awful holes/banding in my effect!

The current fractal noise routine may create undesirable patterns such as holes and bands, especially at higher resolutions. Turn down the contrast and amplitude to make them less apparent.

I see jaggies in volumetric shadows and object intersections!

If you're getting jaggies, try 1) increasing samples, 2) turning off 'no Antialiasing' or 3) if you're using a shadow map, increase its resolution.

Particles are popping in and out of existence!

Watch out for dying particles. When they disappear, the Steamer effect will suddenly vanish too. The best solution is not to let particles die. If they must be recycled, make sure your active light falls off to zero before they disappear.

I get the message "Steamer-ParticleStorm link not active!"

You accidentally installed an old version of psplay.p. Copy it from your Lightwave distribution CD again, or check http://www.dynamic-realities.com

The preview area doesn't show my changes!

Steamer's preview window only updates the pixels it rendered on the last pass. You can reset the preview by briefly clicking on one of the pulldown menus.

Steamer crashes!

There are many possible causes. Too many particles often can crash Steamer, as can field rendering, and choosing a render mode setting other than 'realistic.' Save often!

Keep in mind that Steamer is an evolving product, and most of these bugs are already being fixed in the coming version.

Conclusion -

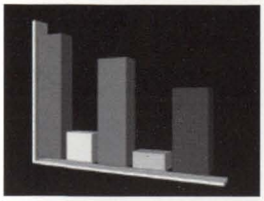
Steamer is a powerful tool, but you must learn when it is appropriate. Sometimes it's more effective to employ 'traditional' techniques to achieve a given effect (e.g., rocket exhaust). Don't use it everywhere simply because it exists. When lens flares first appeared many animators put glaring lens reflections in every shot, creating a cliché look. Don't let the same thing happen with Steamer. Use it sparingly and use it well!

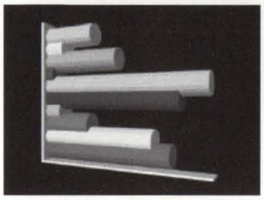
Daniel Maas (age 16) is a freelance 3D artist and runs Digital Cinema (http://www.dcine.com). In his spare time he studies film and computer graphics at Cornell University as a Presidential Research Scholar. Dan can be reached at (607) 347-4590 or dmaas@dcine.com.

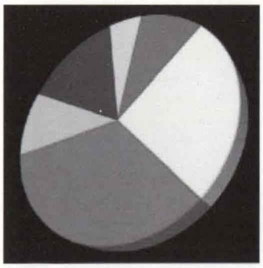
FROM THE FRONT

(From the front - continued from page 8)

amples from this plugin.







SelectPoints - Selects points in a user defined mode. It can be used to remove data from a mesh. Check the images to the right to see what SelectPoints can do for you. Note that after some operations you may want to unify polygons or delete one or two point polygons.

MISSING PAGE NUMBERS

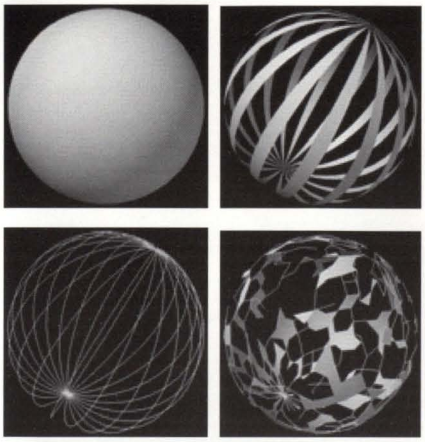
You can imagine our surprise when we received our first batch of issue #3 and saw that they were missing page numbers. It was too late then. It seems people really like them little numbers on the pages. We promise not to let that happen again.

COLORLESS CHANGES

As you may have noticed, the FROM THE FRONT section has a new look. It would seem the majority of our readers concur with the fact that we needed to do something about the blue background to make it easier to read. This is our attempt to rectify this situation. We hope you like it.

OVER 20,000 ATTENDIES SHOW FOR THE 'MOOEY' VIDEO AWARDS

We received a lot of comments here at LightWavin' in regards to Steve Bowie's review on LightWave videos in the last issue. Some of the people writing in wanted to know where the award ceremony was held and who exactly judged each category. I don't know how to say this to you but, uh - there really wasn't an award show. Ron Thornton, John Gross and the rest of the gang didn't really show up at our red-carpeted walk. There weren't really any Mooey awards being given out. People really didn't think this was a real deal, did they? To clear the record, this was Steve's attempt at writing a comprehensive review of the videos while adding some comedy to the mix of things. We apologize to those people who were thrown off.



WHERE'S MARK THOMPSON AND DAN ABLAN?

Another group of people hunted us down and flogged us for not including the very nice and well done ProWave Video tapes which include hosts such as Mark Thompson and Dan Ablan. As mentioned in the article, we didn't have the videos here in time for the review. We promise to do another video review soon and have them included. If you are a company who is about to release some videos and are keeping it under wraps for now, please let us know so that we can get you the information you need to have your videos reviewed.

PLUGINS BY SEAN

Sean has been at it once again. Good for us! Here are a few plugins from Sean Moyer to add to your arsenal.

Weird Growths Version 2: Engine of Creation -Complete rewrite of the original Weird Growths Plugin. The new version gives the user much more control of the growth process. "Engine of Creation" is more than weird growths, it is an iterative engine that produces geometry by applying smooth shift and beveling tools in multiple passes, allowing precise segmented extrusions or, of course, weird growths. Weird growth options include 'Tentically,' 'Squidgy,' 'Planar Whatzit,' and (my new favorite) 'Mechano.' Since iterative operations are based on smooth shifts and bevels, geometry that begins with quads (or tris, in 5.5) can be metaNurbed for even more weird fun.

Sean's App Launcher - Add Photoshop (or any other program) to your hotkeys!

Sean's High Testosterone Rename/Renumber Plugin - A high power batch renaming/renumbering utility for image sequences, with many auto-magic extras. NEWSFLASH: If you use the new savemorf.p in layout, use this plugin to renumber object sequences, too! Recompiled for LScript

All plugins have undergone another change, they are no longer shareware, they're Coolware. You like, you use, you make Sean feel good about his work by sending him something cool. See his website for details. http://www.geocities.com/Area51/Cavern/2468/ Oh, and guess what? All three plugins can of course be found on the LightWavin' CD-ROM.

TutorVision 3-D CD Volume 2

Event Horizon Studios, creator of TutorVision 3-D CD, will soon be releasing a sequel to the groundbreaking first volume! TutorVision 3-D CD Volume 2 will teach you everything you need to know to start doing Character Animation with LightWave 5.0 & 5.5 and unlike other tutorial CDs and videos, all Video Tutorials play back at full-size (640x480) on your computer monitor! Featured Video Tutorials include: - A quick and easy way to model a character with MetaNurbs. - Setting up bone skeletons and Inverse Kinematics. - Making you character Walk, Run, and other common movements. - Interacting with other objects (Picking stuff up). - Lip-syncing and Facial Expressions. - Applying various character animation plugins. There are also many text tutorials included. TV3D will also include the following new features: - A completely re-designed interface. - 'Talking-head' intros for each video clip. - A continuous-play mode that will allow users to view most of the CD-Rom content without lifting a finger. - Now fully Macintosh compatible! - Improved Amiga compatibility! - Many other improvements and new additions! TutorVision 3-D CD Volume 2 will begin shipping in October 1997. For more information and a free demo, contact Event Horizon Studios. Orders / Info: (518) 756-6850 FAX: (518) 756-6836 E-mail: info@tv3d.com Web-Site: http://www.tv3d.com

If you would like to order the LightWavin' CD-ROM for this or any other issue of LightWavin' Magazine, please call 805-726-3546. That's it for this issue. If you are a developer with a press release or if you have some newsworthy information, please e-mail the information to us at lightwavin@qnet.com with the subject header listed as "FROM THE FRONT NEWS."

PHOTOREAL

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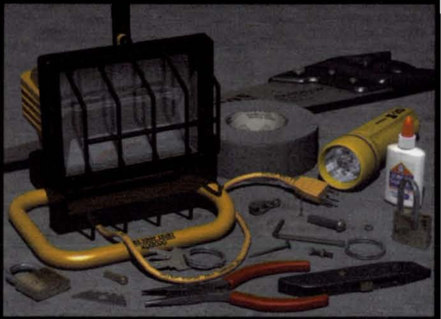

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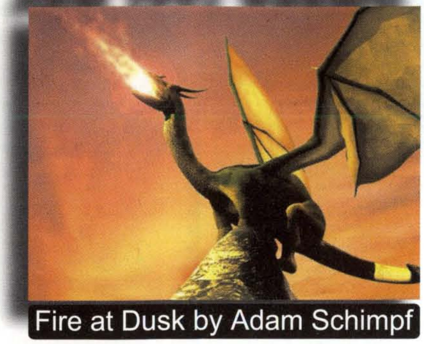

Fire at Dusk by Adam Schimpf

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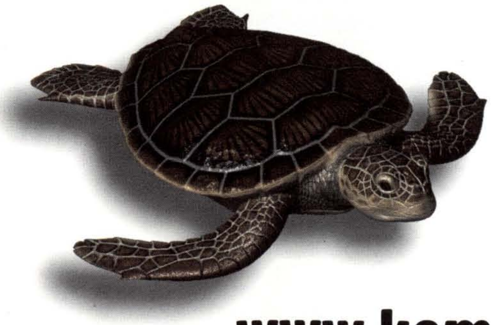
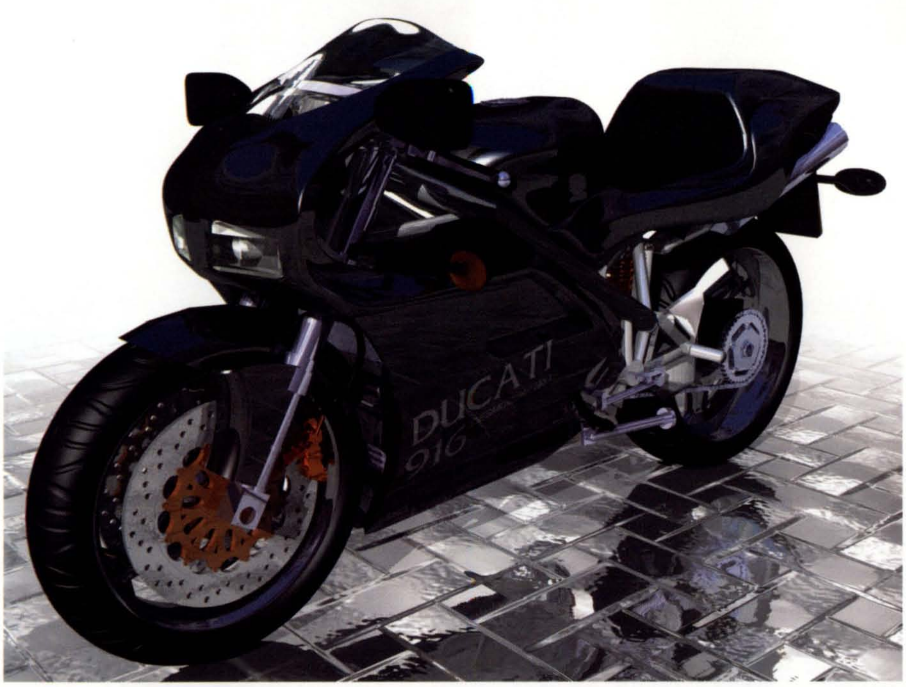
Are you the Best 3D artist on the Planet? Here's your chance to prove it! Every two months Komodo Studio and Lightwavin' Magazine will host an internet-based 3D challenge. The August/September challenge has been sponsored by the *SeaWorld/Busch Gardens Animal Information Database*. You'll have two months to create your awesome 3D rendered scene of ocean life. You can render anything under the sea. Images are judged by a panel of 20 industry experts who will award winners the prestigious "LOUIE" award - the Academy Award of the 3D industry. **The Internet 3D Challenge is open to ALL ANIMATORS** regardless of software used. To find out more about the Internet 3D Challenge ***visit our web site at www.komodostudio.com/3dchallenge.***



"SeaWorld and Busch Gardens are proud to support and participate in the Internet 3D Challenge," says Pamela Wilson, Internet Coordinator for SeaWorld/Busch Gardens Animal Information Database. "Not only is it a unique educational enrichment, it also communicates - in a fun, entertaining and interactive way - issues such as animals and conservation, which is what we're all about.

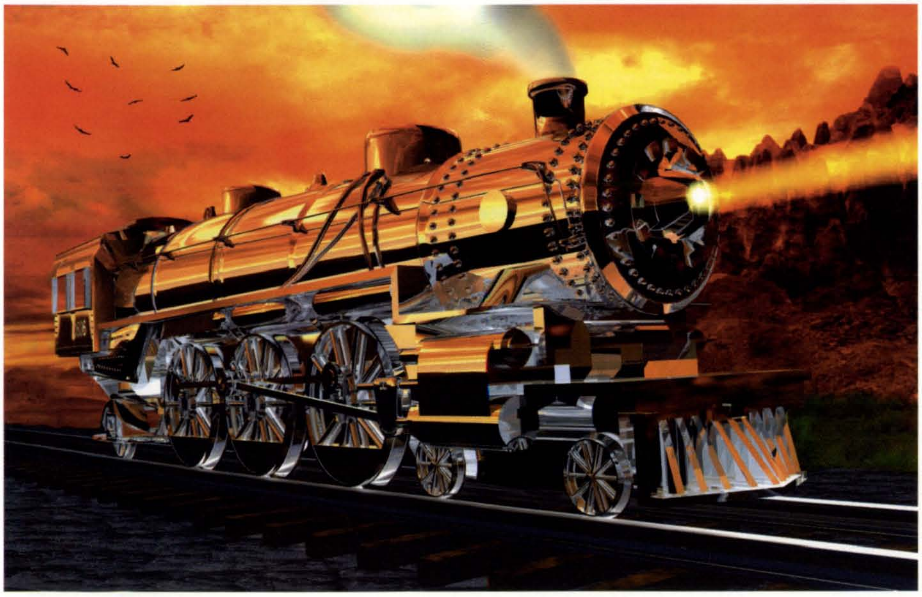
www.komodostudio.com/3dchallenge

IMAGE GALLERY



Ducati 916 Desmoquattro

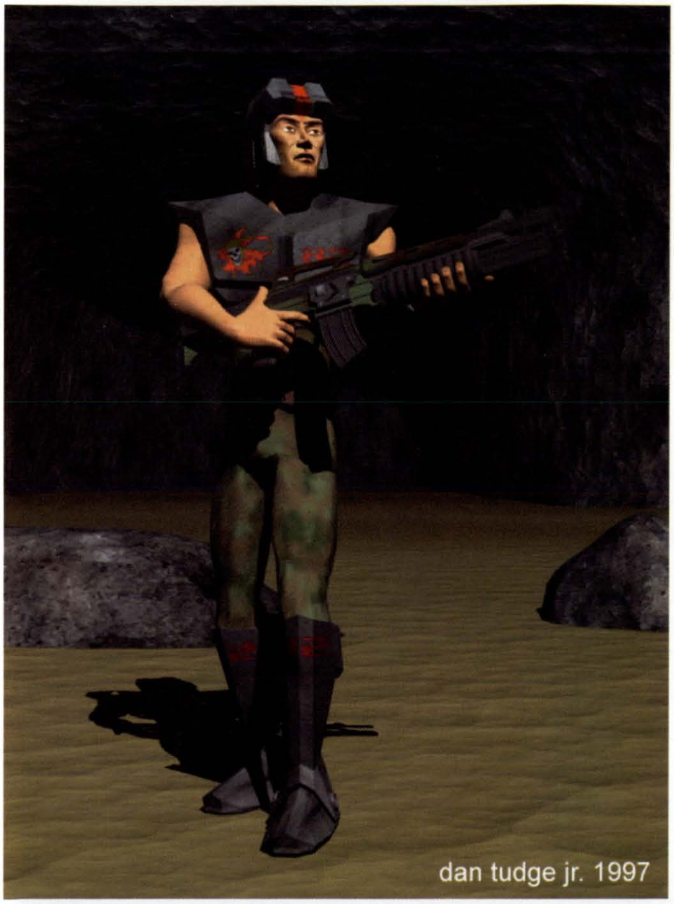
Machine: Dual Pentium Pro 200, 128MB RAM - Polygons: 160,000 - Surfaces: 19 - Image Maps: 5 - Render Time: 30 minutes - Software: Rendered in LightWave 5.0. This started from an idea in the autumn of 1996. A friend and I got talking about bikes (our favorites) and this led to me to have a go at copying a Ducati. I purchased a 1/12th scale model of the bike and as I built this up I copied each individual part into LightWave. The majority of the frame and engine were basic shapes and did not need much thought on how to draw them. For example the silencer boxes on the exhaust pipes are just cylinders. The chain segments on the bike were simple polygons extruded and then a couple of sections were cut away using the boolean tool and then mapped to a path to follow the chain shape. More complicated things such as the exhaust pipes were just circles following a spline path. The tri-spoke wheels where originally a 6 path spline trail, but in the end I remodeled them using nurbs. A question that many people ask me is how I modeled the Pirelli Dragon type tread. I copied the tread by drawing simple polygons and rendered this in LightWave to produce a two color bump map. This was then blurred to achieve soft edges and used as a bump map on the tire texture. This was the same for the radiator at the front of the bike - a simple checkered bump map. The fairing and body pieces were all constructed from Metanurbs and did not pose that much of a problem. Had I used version four of LightWave then it *would* have been a problem. The bike was constructed in about three months of "here and there" modeling in the fall of 1996 (all the time I had since I was pursuing a full time education). ©1997 James Hans xedos@dial.pipex.com



Sunset Train

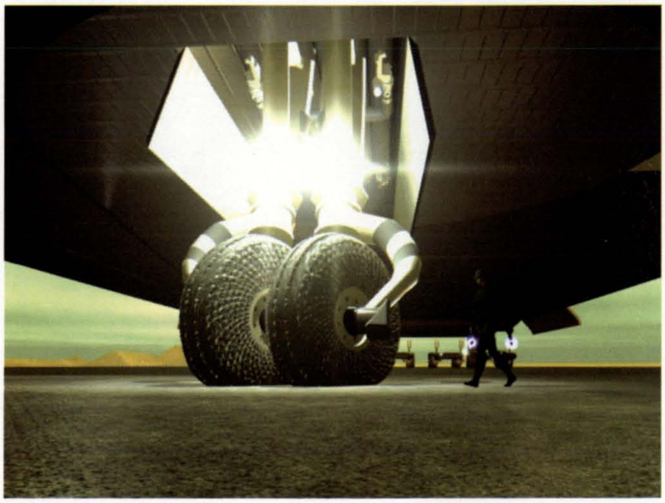
Robert E. McKeever iss a 33 year old photographer/Lightwave animator working in Central New Jersey. "The train image was created as a self-promotional piece. It was inspired by an old 1964 Lionel Ho Engine that I had found in my parents attic and had setup for my sons during the holidays. The train has a polygon count of 41,799 to be exact, and has been reduce for the animation version to around 21,000 polygons. The scene was modeled and surfaced with layered procedural textures. Mountains (modified DEM), ground, clouds (arrays of spheres), sky (BIG stretched spheres), and birds were all modeled, surfaced and rendered in layout with the train removed. The resulting image was loaded as a spherical reflection map and applied to the train, as well being used as the background image. The tracks and train models were then rendered with the same camera position used for the background geometry. The stack smoke was added post in PhotoShop. The image supplied was rendered at a resolution of 1600x1150 with trace reflections and high antialiasing in 26 min. on a Pentium Pro 200 w/96 megs of ram running Lightwave 5.0m." ©1997 Robert E. McKeever bmckeev@detour.com

IMAGE GALLERY



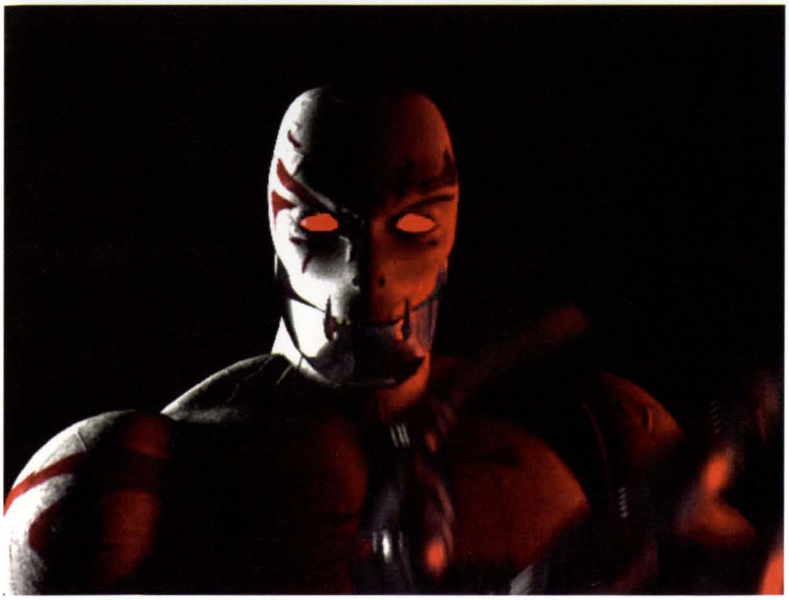
Commando

(LEFT) This scene was done solely for my demo reel with LightWave3D ver. 5.0. The character took approximately 80 hours to model and texture map. The scene has 82 objects, 171,557 polygons, 61 surfaces, 23 Images, and 2 lights. I modeled this guy primarily with Metaform-plus not Metanurbs simply because I needed to model with 3-point polys as well as quads. I hand painted all the textures primarily with Photoshop, using LightWave in a 2D manner to illustrate out the original contours like in the "joker" decal. ©1997 Dan Tudge Jr.
www.bcsupernet.com/users/danman dan@morganmedia.com



VAMjet

(ABOVE) This image is from as animation titled VAMjet. In the animation, the Van Andel Museum Center of Grand Rapids, Michigan is transformed into a jet. The model includes over 45 images for texture maps, 800 lights, 450 objects, 1000+ surfaces and 400,000 polygons. Software used: LW 5.0 running on a DEC Alpha Raptor 3, 300 MHz with 128 meg RAM using NT 3.51. Legal Graphic Communicators - Jim Jongsma 616-956-9009 - jimj@legalgraphic.com ©1997 Jim Jongsma



Alien

(LEFT) The alien to the left was modeled and animated for inclusion in my demo reel. ©1997 Tareq Mirza

If you have images you would like to submit for inclusion in our Gallery, please e-mail them to lightwavin@qnet.com along with a text file description of what you are submitting.

The Science of the Art

Tracking the shot

by Alan Chan

In trade magazine articles about CG effects shots, one key component seems to be taken for granted when talking about the process of creating special effects shots, the issue of 3D tracking.

The term '3D tracking' or 'matchmoving' the shot refers to process of determining the position, angle, focal length and other relevant information about the camera throughout a given shot. Don't confuse this with 2D tracking or stabilizing, which essentially locks a flat foreground image onto a background plate by determining the amount of image shake or shudder in the background plate and applying that same amount to the foreground image. 2D tracking is available in compositing programs such as Adobe After Effects or Eyeon's Digital Fusion. It works in limited cases, but cannot compensate for complex camera moves.

We could, for instance, use 2D tracking software to track a shot in which the camera moves left to right, if the subject is far enough away from the camera to eliminate perspective distortion. If, however, the object is too close, or if the camera was moving in some other fashion, the lack of perspective change on the rendered element would immediately be obvious. This is where '3D tracking' comes into play.

3D tracking, in simple English, recreates a virtual camera inside your computer that behaves exactly as the real camera did. Assuming that we match the surfacing and lighting, we can add "shoot" whatever we want with the virtual camera, render and composite it with the background plate, and it will seem to be a natural part of the shot. What we are in fact doing, is mimicking the motion of the real camera so that our CG elements will have the same rotations and translations as the plate. What sounds simple at first is in fact a tricky process, fraught with unforeseen problems. Procedures we assume will work sometimes do not.

Those of you who have had to integrate LightWave elements with a background plate have probably done it this way: load in the background sequence, make a preview, then load in some geometry that's relevant to your background plate and position the camera by eye until it looks right. While this will work for lockdown shots or simple camera moves, it is useless for a crane shot with a zoom right in the middle - especially if the camera notes specify that THERE IS NO CAMERA ZOOM IN THIS SHOT. Of course, if you niggle at the scene long enough, you can probably create a camera motion and zoom envelope that matches your shot, although the amount of time you spend doing that would be prohibitive. There are other, better ways of tracking your shot.

Here at Digital Domain we use a proprietary 3D tracking program developed by Senior Software Engineer Doug Roble that requires two components - location survey data and the background plate. The program takes the survey data and matches it to the background plate in order to generate the necessary camera information.

Good survey data is important. It provides for a clean efficient transition from realspace to cyberspace by measuring and recording selected points from a set or location and translating those to the corresponding points of an object file which is fed into the tracking program and used to calculate the position of the camera.

This all works out fine and great for us, but "what about the LightWave masses?," you ask. The problem is, there is no 3D tracking software publicly available for NT yet. As of this writing there are rumors of such a program becoming available soon; but there hasn't been a big demand for 3D tracking software for these reasons:

1.) Television budgets and schedules rarely allow such shots.

The difference between a television episode and a feature film is time and money. A tracking shot requires more setup and man hours to recreate the virtual camera. So when such a shot is called for on television, it almost always ends up being done as a lockoff shot. Ergo, no 3D tracking or tracking software required. For those few shots that DO make it through and require tracking...

2.) Television work hasn't required supercritical tracks.

There are a lot of things that can be hidden in D1 - a less than perfect track being one of them. Film resolution, however, is not forgiving. In its roughly ten times more screen real estate than video has, a bad track WILL show. As LightWave and NT begin to move into feature film production, the need for a 3D tracking program for NT-based effects houses will become more and more apparent.

3.) The majority of other LightWave users - editing facilities, industrial video producers - don't have many clients that ask for such shots... yet.

The need for 3D tracking is a natural extension of digital technology's ability to augment an image. Currently, this ability is only being applied in high-end effects houses. As the technology improves and trickles down to the masses, though, clients will begin to ask for more digital augmentation. Tracking shots for 3D will become more and more tiresome for producers, and the need for a simpler 3D tracking solution will increase.

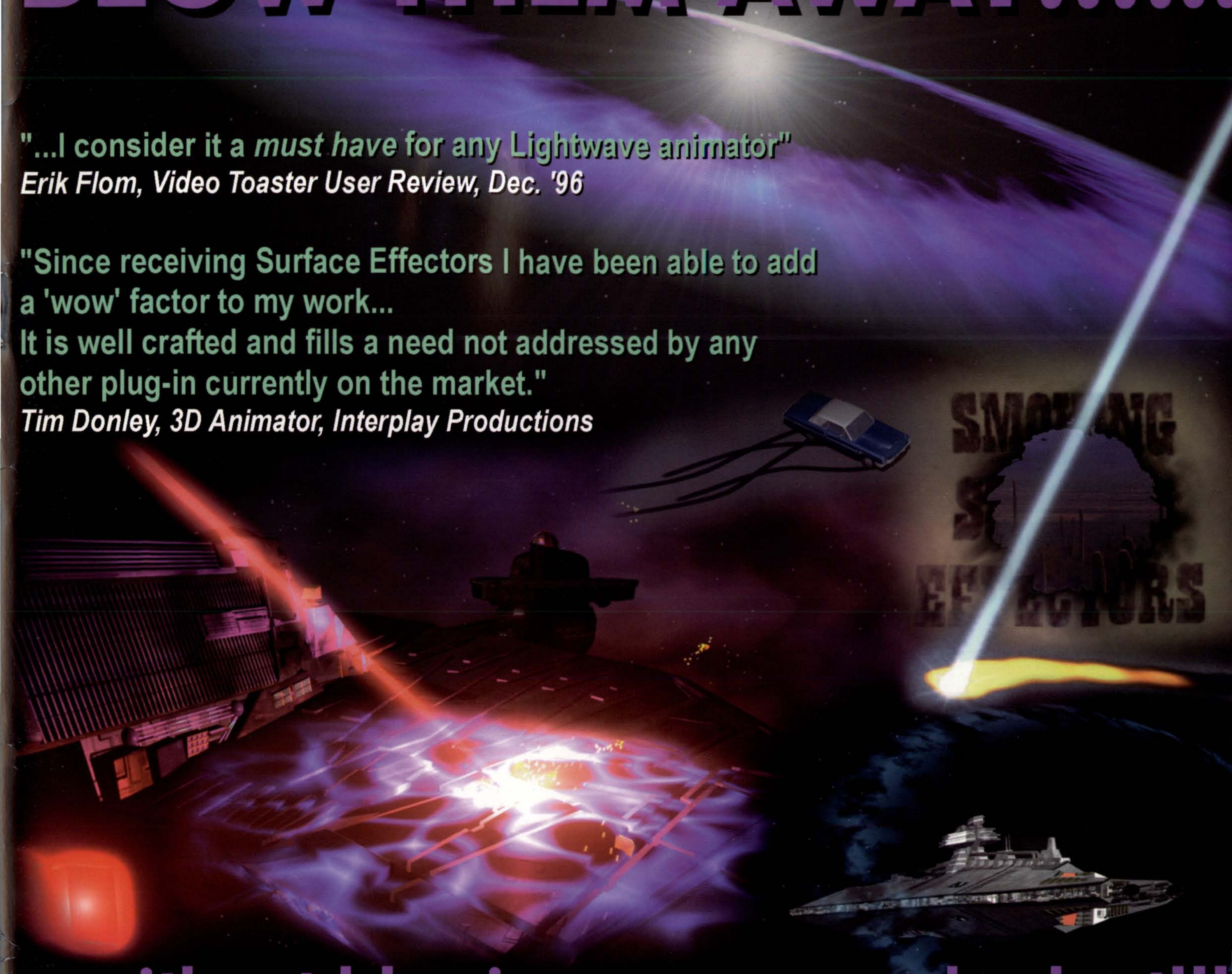
The lack of a 3D tracking solution for NT is one barrier to the field of high-end special effects for NT-based shops (the other is the lack of good compositing software; but that's a topic for another column). Until now, LightWave users have relied on their ingenuity and 'work-around' skills to come up with viable stopgap solutions to track their shots. This, coupled with the fact that a majority of LightWave work is still for television, makes the need for tracking software less urgent than we would like No software developer has taken on the programming because there is not enough demand or financial gain to make writing such a program worthwhile. Or is there?

[subtitle: If you write it, they will come]

If recent industry trends are any indication, we can anticipate a growth of the use of NT apps in the high-end effects field. As LightWave continues to push deeper into feature film work, the need for a robust tracking program will become much more apparent. We use it on pretty much every commercial and feature film project we do. Our work on the much-anticipated James Cameron movie 'Titanic' could not have been achieved without the use of our in-house tracking software. We wouldn't even have wanted to *try* to do it without 3D tracking software.

3D tracking programs are like those niggling little convenience applets; you think you can do without them until you've used them once and found the ease and power they afford. Then you can't live without them. ■

BLOW THEM AWAY!!!...



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Erik Flom, Video Toaster User Review, Dec. '96

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Have you found surfaces in Lightwave limiting? Have you always wished there was a little "E" button next to all those fields on the Surfaces Panel? Well, despair no longer...Surface Effectors/DSFX is a powerful plugin that **unleashes your surfaces** in Lightwave, allowing you to achieve dynamic surfacing effects in record time without resorting to complex image mapping sequences. Use animated nulls (called Surface Effectors) to **envelope your surfaces'** color, diffuse level, luminosity, specularity, reflectivity, transparency, edge opacity and index of refraction; control surface color using the HLS color model, allowing for **unique "colorizing" effects**; restrict the effect to a localized area with **fully animateable inner and outer effect radii**; group Surface Effectors together and control them all with a fe mouse- clicks; modulate the effect with a **dynamic, fully animateabl fractal noise** (including a time-turbulent variant that does grea smoke/vapor effects); **leave animated trails with variable deca** behind your Surface Effectors as they whiz around your scene (thi does great **laser burn-aways, auto skid marks, rocket trails,** etc. use a special "ripple mode" to create **dynamic shockwave and rippl effects**; save time and money; impress your co-workers; dazzle you friends; and, above all, **blow your clients away** with the remarkabl effects that you can do...just be sure not to tell them how easy and fu it was using SE/DSFX, or they might not want to pay you...

"Phaser firing on Klingon cruiser" image courtesy Michael Sherak, Interplay Productions...look for it in Interplay's hit game "Starfleet Academy"

To purchase SE/DSFX, contact your local dealer or call Prem Subrahmanyam Graphic Design at (904) 575-6051 (M-F 10AM-6PM EST) or visit the SE/DSFX homepage (and pick up a free demo) at: http://www.noblestar.net/~prems/ppp.html

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